HUMAN VACCINES & IMMUNOTHERAPEUTICS
2022, VOL. 18, NO. 1, e2029258 (7 pages)
https://doi.org/10.1080/21645515.2022.2029258

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RESEARCH PAPER

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Knowledge and attitude on infant vaccination among university staff in Malaysian public university

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ABSTRACT

Objective: To determine the knowledge and attitude on infant vaccination among a couple of Universiti Putra Malaysia (UPM) staffs in Serdang, Selangor. Methods: A cross-sectional study was carried out involving 97 respondents. A cluster sampling technique for the categorization of the faculty in UPM to science-based and non-science-based is used. Then, fishbowl technique was adopted in selecting the faculty from the two categorizations, which consists of 1) science-based: Faculty Biotechnology and Science Biomolecule and Faculty of Science; 2) non-science-based: Faculty of Economics and Management and Faculty of Language and Communication. Consequently, a simple random method was used to choose the respondent based on the inclusion and exclusion criteria. Data on socio-demographic characteristic, knowledge and attitude regarding infant vaccination were collected using a modified and pretested questionnaire. The data then were analyzed using SPSS version 22. Results: Of 97 respondents, 78 (80.4%) had high knowledge, and 49 (50.5%) have moderate attitude regarding infant vaccination. Overall, science-based faculty and non-science-based faculty prevalence of refuse infant vaccination was 2.1%, 6.5%, respectively. There was a significant association between educational level and the knowledge ($p < .05$, $p = .019$). However, there was no significant association between socio-demographic and attitude. Other than that,, there was no association between knowledge and attitude among these two different types of faculty ($P > .05$, $p = .256$, $p = .597$). Conclusion: Effort are needed for focusing on health education campaign with collaboration between health-care professionals, social media and community to improve their awareness for immunization.

ARTICLE HISTORY
Received 10 October 2021
Revised 12 December 2021
Accepted 10 January 2022

KEYWORDS
word; infant vaccination; knowledge; attitude; university staff; public university

Introduction

A vaccine is one of the most extraordinary findings in the medical field. Instead, Lim et al.[1] stated that it is the most effective and cheapest method to prevent or reduce the burden of vaccine-preventable disease; it is a biological preparation that increases body immune system toward targeted disease.[2] The vaccine is made from weakened or killed microbes. Toxins or surface protein from this microorganism will stimulate the body immune system to destroy and memorize it so that the immune system can easily detect and destroy any of the microorganism in the next encounter.[3] World Health Organization has estimated that immunization has averted between 2 and 3 million deaths each year.[4]

Recently, there are reported cases where parents refuse to complete their children's vaccination. Reported by Bedford et al.,[5] vaccination safety scare has led to long-term reductions in coverage, as evidenced by reduced coverage of Measles-Mumps-Rubella (MMR) vaccine in many countries post the suggested the association with autism. While most people vaccinate according to the recommended schedule, this success is being challenged by individuals and groups who choose to delay or refuse vaccine.[6]

Edward Janner was the first person to the introduced vaccine against smallpox in 1796. It happens, when he discovered that daily house cleaners with cowpox were immune to smallpox.[7] Meanwhile, in the history of the sentiment anti-vaccination, there was a growth of the anti-vaccine group in England. This was due to a study by Andrew Wakefield, published in the Journal Lancet in 1998, claiming that the vaccine causes autism. In his study of 12 autism children, linking the problem is due to the measles, mumps, and rubella (MMR) injection. According to his study, the substance in MMR vaccine named thimerosal that functions to stabilize the vaccine is associated with the cause of autism. Since then, the anti-vaccine group has become increasingly contagious.

According to the Centers for Disease Control and Prevention,[8] the studies have shown that there was no link between receiving the vaccine and developing of autism. In 2011, a study by DeStefano[9] of the Institute of Medicine (IOM) on eight vaccines given to children and adults found that with rare exceptions, these vaccines are very safe. Additionally, in the previous 14 years' study from numerous countries, it is shown that there were no linking vaccines to autism.[10] The transmission can happen when people have direct contact with the contaminated urine of infected animals or indirectly through the exposure to water or soil that contaminated with urine or secretion of infected animals.

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For the past few years, a measles outbreak was detected in many European countries during July 2014–June 2015.[11] In 2015, it was estimated that 61% of children who have measles have no immunization; in which 28% are not immunized, and 33% of children are not eligible for injection.[12] According to Mohd Azizi et al.,[13] for the past decades, Malaysia has achieved more than 95% immunization coverage among infants and young children.

However, the cases of vaccine refusal have been increased from 470 cases to 1292 cases in the year 2013–2014. The increase of cases was regarding the number of parents with children aged below 2 years that refusing the vaccination for their child. More worsen; the diphtheria cases had become more distinct with the reemergence in June 2016. Further, investigation revealed that deceased infants did not receive the complete set of recommended vaccination, which they lead to the complication developed by the infection.[14] Previous studies on childhood immunization have reported that the misconception for the knowledge and negative attitudes among parents regarding the immunization.[15] According to Ministry of Health Malaysia,[12] the infant stage is the most vulnerable time for children to develop their immune system. Parents' knowledge and attitude regarding immunization are the most important factors on the immunization status of their children.[16] Much has been published regarding childhood immunization in Malaysia.[17–25] Nevertheless, a number on immunization is little available on immunization coverage in institutes of higher education. Due to that, this study was conducted to determine the level of knowledge and attitude regarding infant-vaccination among married staff in science-based and non-science-based faculties in UPM, Selangor.

Material and methods

Study location and study design

A cross-sectional study was conducted between June 2021 to August 2021 involves 97 staff in two different types of faculty in Universiti Putra Malaysia (UPM), Selangor. UPM has 16 faculties which include non-science-based categories (Economics and Management, Modern Languages and Communication Design and Architecture and Educational Studies) and another science-based (Agriculture, Engineering, Computer Science and Information Technology, Medicine and Health Sciences, Science, Veterinary Medicine, Biotechnology and Biomolecular Sciences, Food Science and Technology, Forestry and Environment). The total university staff is 7,968 was obtained from website.

Sample size and sampling method

Sample size estimation was done using a formula as described by Lemeshow et al.[26] The sampling method used has two stages, which were cluster and simple random sampling, respectively. In stage one, by applying cluster sampling, all the faculty in UPM was divided into two groups, which was science-based and non-science-based. Then, two faculties from each category were selected by using fishbowl technique. Consequently, the purposive sampling method was used to choose the respondent based on the inclusion criteria.

Data collection

Inclusion criteria

Staff in the chosen faculty who have married and have children.

Instrument

The primary tool of this study was a questionnaire, which involved three parts: The first part of the questionnaire reflects on the socio-demographic characteristics of the respondents. This part includes the educational level, type of faculty, work classification, family income, decision-maker for immunization, source of information about Vaccination and from where their children get the vaccination. The second was the knowledge item regarding the general question on childhood vaccination such as the advantages and disadvantages of vaccines. The third and last parts were related to the attitude of the parents toward the vaccination regarding the acceptance of vaccination and the opinion of parents toward safety and effectiveness of the vaccination as a primary prevention of infectious disease either they refuse vaccination for their children and the underlying factors of the refusal. The reliability of the questionnaire in this study was 0.8. This questionnaire was modified from the previous study.[27] A pilot study was conducted for internal consistency of the questionnaire. The Cronbach's alpha values around 0.7.

Study approval

The research proposal was submitted and approved by the Research Ethics Committee (JKEUPM) of University Putra Malaysia (JKEUPM-2-17-184) before the data collection started.

Data analysis

Data analysis was conducted using SPSS version 22. The correct response for knowledge of the respondents were assigned 1 and incorrect response assigned 0. The responses were added together to generate a total knowledge score ranging from a minimum of 0–15, and the overall score was referring to Modified Bloom's cut off.[28] A score of 80–100% of correct response meant an excellent knowledge; a score of 50–79% put a scorer in a moderate level and a poor knowledge with a score less than 50% of the correct response. This scoring applies the same for the attitude. Higher score of attitude 80–100, 50–79 for moderate attitude, and <50 for low attitude, respectively. Response to attitude was on a 4-point Likert-type scale. Descriptive and chi-square test and Fisher's Exact test were used in this study.

Results

A total of 97 respondents that were selected, all participated and completed the questionnaire giving a response rate of 100%. Table 1 shows that most of the respondents consist of female staff, 68 (70.0%). Malay 94 (96.90) was the highest respond in this study, as most of the staff in UPM consist of Malay staff. More than half 84 (86.6) of the couple make a decision together for their children immunization, and most of them, 68 (70.1) get it from government hospital/clinics. Most of respondents 50 (51.50) were age more than 35, and 39 (40.20) of them have a moderate family monthly income. Doctor 75 (77.3) and internet 64 (66.0) were the primary sources of vaccine information. Distribution of respondents' according to faculty was almost the same, but for the occupation, the non-academic staff was more which was 67 (69.1) compared to academic staff 30 (30.9).

Table 1. Distribution of sociodemographic.

	Frequency (%)	Mean
Gender		
Male	29 (29.90)	1.70
Female	68 (70.10)	
Race		
Malay	94 (96.90)	
Chinese	2 (2.10)	1.04
Indian	1 (1.00)	
Age		
<35	47 (48.50)	1.52
≥35	50 (51.50)	
Family Monthly Income	33 (34.00)	
<RM5000		
RM 5000- RM 10000	39 (40.20)	1.92
>RM 10000	25 (25.80)	
Decision Maker for Immunization		
Friends	3 (3.10)	
Health care professionals	10 (10.30)	2.84
Parents	84 (86.60)	
From where your children get Vaccination		
Government hospital/clinic	68 (70.1)	1.30
Private hospital/clinic	29 (29.9)	
Source of information regarding Immunization program		
Television	43 (44.3)	
Internet	64 (66.0)	
Radio	17 (17.5)	1.90
Newspaper	23 (23.7)	
Doctor	75 (77.3)	
Family/ Friend	48 (49.5)	
Educational Level		
UPSR	1 (1.00)	
SRP/PMR/SPM/STPM	16 (16.5)	2.81
Diploma/Degree /Master/PhD	80 (82.5)	
Type of Faculty		
Science-based	48 (49.50)	1.51
Non-science-based	49 (50.50)	
Occupation		
Academic	30 (30.90)	1.69
Non-academic	67 (69.10)	

Based on Figure 1, shows the prevalence of infant vaccination by faculty among the staff of UPM. Of the 97 respondents, 4 (4.1%) had refuse infant vaccination. For science-based faculty, only one (2.1%) respondent of 48 refuses infant vaccination, while for non-science-based faculty, 3 (6.5%) of 49 respondents choose to refuse infant vaccination.

Table 2 shows that 78 (80.4) of the respondents have high knowledge, and only 2 (2.1) have in-depth knowledge. While for attitude, 49 (50.5) have a moderate attitude and only 1 (1.0) shown low attitude regarding infant vaccination.

Based on Table 3, there was a significant association between educational level and the level of knowledge (p-value = .019). Table 4 shows that there was no significant association between socio-demographic and attitude (p-value > 0.05). In addition, Table 5 shows that there is no significant association between knowledge and attitude between these two different types of faculty.

Discussion

Overall, the level of knowledge on infant-vaccination among UPM staff was considered as high with 78 (80.4%), while most of them have moderate attitude 49 (50.5%). This might be due to nowadays of messages and vaccination policy much more easily obtained from healthcare providers and immunization coverage by hosting immunization program. This result is consistent with other studies showed that parents who obtained information from healthcare providers were more likely to have better knowledge on childhood immunization.[29,30] In addition, the majority of respondents in this study had moderate attitude. Possible reasons for this attitude might be due to parents living in urban area has good availability and easy to get access can contribute to favorable attitude toward infant vaccination. The results of the current study are supported by Zhang et al.[31] shows that the urban population has acceptance and their positive attitude toward acceptance of vaccination. For item, vaccination is used to cure disease, and given starting after birth, there was 1% of

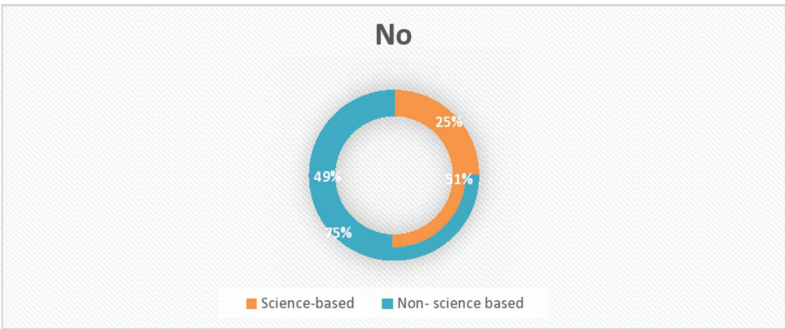

Figure 1. Prevalence of staff that refuse infant vaccination.

Table 2. Level of knowledge and attitude.

Variables	N	(%)	Mean (±SD)	Min-Max
Knowledge				
Low	78	80.4	85.57 (±11.57)	53–100
Moderate	17	17.5		
High	2	2.1		
Total	97	100		
Attitude				
High	47	48.5	82.76) (±11.29)	50–100
Moderate	49	50.5		
Low	1	1.0		
Total	97	100		

Based on Table 3, there was a significant association between educational level and the level of knowledge (p-value = .019). Table 4 shows that there was no significant association between socio-demographic and attitude (p-value > 0.05).

the respondent that answer no. Most of the respondent know that vaccine is vital to prevent disease in the community, and they agreed that they need more information about the vaccine.

The association between knowledge and socio-demographic (age, gender, educational level, and monthly income) among the staff have been studied. The result shows that there is a significant association (χ^2 = 4, p-value = .019) between knowledge and the educational level as the p-value is less than 0.05. This might be due to the fact that university staff are easy to get more information than the general population which makes them advantageous over part of the others society. This finding was consistent with Ahmed Abdulrahman et al.,[15] which stated that there is a significant association between educational level and knowledge on vaccination. As reported by Tauil et al.,[32] low educational level and low socioeconomic status were both associated with incomplete or delayed vaccination.

However, for the gender, monthly income and age show that there is no significant association as all the p-value is more than 0.05. For the age aspects, this finding contrasts with the previous study by Omar et al.[4] conducted in Saudi Arabia, which showed that there is an association between paternal age and knowledge and attitude toward child vaccination.

The high level of knowledge shows female has a high percentage of which 56 (82.35%), compared to male, only 22 (75.86%). In the study by Qutaiba et al.[33] shows that there is a significant association between parent's gender and knowledge regarding immunization. Mother's knowledge is an important factor to decision makers for childcare and vaccine decision.[34–38] However, male partners were often cited as being against vaccinating the children.[39–44]

Table 3. Association between socio-demographic and knowledge.

	Knowledge, n (%)		[a]X^2		
Demographic variable	High	Moderate	Low	*p-Value	
Gender					
Male	22 (75.86)	6 (20.69)	1 (3.45)	.728	.695
Female	56 (82.35)	11 (16.18)	1 (1.47)		
Total	78 (80.41)	17 (17.53)	2 (2.10)		
Age					
<35	39 (83.00)	8 (17.02)	0 (0.00)	1.968	.374
≥35	39 (78.00)	9 (18.00)	2 (4.00)		
Total	78 (80.41)	17 (17.53)	2 (2.10)		
Educational Level					
UPSR	1 (100.00)	0 (0.00)	0 (0.00)		
PMR/SPM/STPM	13 (81.25)	1 (6.25)	2 (12.50)	11.791	*.019
Diploma/Degree/Master/PhD	64 (80.00)	16 (20.00)	0 (0.00)		
Total	78 (80.41)	17 (17.53)	2 (2.10)		
Monthly Income					
<RM 5000	26 (78.79)	6 (18.18)	1 (3.03)		
RM 5000-RM 10000	32 (82.05)	7 (17.95)	0 (0.00)	1.479	.830
>RM 10000	20 (80.00)	4 (16.00)	1 (4.00)		
Total	78 (80.41)	17 (17.53)	2 (2.10)		

[a]Fisher's Exact Test.
*p-value <0.05 is significant.

Table 4. Association between socio-demographic and attitude.

	Knowledge, n (%)				
Demographic variable	High	Moderate	Low	[a]X2	*p-Value
Educational Level					
UPSR	1 (100.00)	0 (0.00)	0 (0.00)		
PMR/SPM/STPM	13 (81.25)	1 (6.25)	2 (12.50)	11.791	*.019
Diploma/Degree/Master/PhD	64 (80.00)	16 (20.00)	0 (0.00)		
Total	78 (80.41)	17 (17.53)	2 (2.10)		
Monthly Income					
<RM 5000	26 (78.79)	6 (18.18)	1 (3.03)		
RM 5000-RM 10000	32 (82.05)	7 (17.95)	0 (0.00)	1.479	.830
≥RM 10000	20 (80.00)	4 (16.00)	1 (4.00)		
Total	78 (80.41)	17 (17.53)	2 (2.10)		

[a]Pearson Chi-square.
*p-value <0.05 is significant.

Table 5. Comparison of knowledge and attitude between staff in science-based and non-science-based faculty.

Demographic Variable	Knowledge, n (%)		aX^2	*p-Value
	Science-based	Non-science-based		
Knowledge				
High	41 (85.4)	37 (75.5)	2.725	.256
Moderate	7 (14.6)	10 (20.4)		
Low	0 (0.0)	2 (4.1)		
Attitude				
High	23 (47.9)	24 (49.0)	1.031	.597
Moderate	25 (52.1)	24 (49.0)		
Low	0 (0.0)	1 (2.0)		

[a]Pearson Chi-square.
*p-value <0.05 is significant.

The total number of staff that refuse infant-vaccination was 4 (4.1%). For science-based faculty, only one (2.1%) respondent of 48 refuses infant vaccination, while for non-science-based faculty, 3(6.5%) of 49 respondents choose to refuse infant-vaccination. From the previous, the study by Danova et al.[45] stated that there were 2.29% cases of refusal, which is a statistically significant increase in trend. A majority, 3 (3.1%) of the respondent who refuses vaccination agree that time constraint and poor quality of information is the main reason why they do not vaccinate their children. The hectic schedule of work was one of the factors of the time constraints. These findings were constant with the study by Lim et al.,[46] which stated that the majority of the parents claimed to be busy with work as a result of not vaccinating their children. As reported by Danova et al.,[45] it was stated that there was an association between sources of information and refusal of vaccination. In that study, it is shown that refusing parents have been mostly looking for information about vaccination on web pages which not all the information given there is the real fact which is low quality. Other than that, Forster et al.[47] stated that parent's distrust in the government originated from historic health scares that remained in their memories, believing that government conceals information also one of the vaccine hesitancy factors.

The level of knowledge and attitude on infant-vaccination have been studied among staff in science-based and non-science-based faculty. The p-value is >0.05 where (x2 = 2, p-value = .256), which show that there is no significant association between knowledge and attitude between these two different types of faculty. This was due to them have access vaccination coverage from the same geographical area to immunization service which educated them to increase their knowledge and attitude toward infant immunization uptake.

In this study, the abundance of Malay respondents may because Malay constitute the highest percentage, which is 68.6% of the population in Peninsular Malaysia.[48] Most of the respondents, 75 (77.3%), choose a doctor as their primary source of information regarding immunization. These findings were constant with Enkel et al.,[49] which stated that those who expressed more significant concerns about vaccines were likely to get the information from medical professionals. This finding is consistent with other studies reported that the physicians are important role of giving the correct information delivery of vaccinations during childhood and to influence parents decisions to make the right decision[50–55] compare than Internet-based vaccine information that reaches parents contains anti-vaccine content quite obvious.[56–59]

Limitations

This study only targeted the UPM staff in specific faculty. Hence, the finding of this study may not be generalized to other communities. Besides, the researcher has limited access to approach academic staff, as most of them have a packed schedule. Due to that, the number of academic respondents who return the questionnaire was less than half compared to non-academic staff. Nonetheless, this study has strength that provides knowledge and attitude and associated factors of infant vaccination among staff university which data limited in this area and can be a baseline data for undertake any further intervention.

Conclusion

The study revealed that over half of the respondents had immense knowledge regarding infant vaccination. However, the attitude was moderate. Despite the findings of this study, the educational level plays an important role to improve the knowledge regarding infant vaccination. As the doctor was the primary source for getting information about vaccination, therefore, the healthcare professionals or doctor should take benefit from this study result by educating parents by planning more open and effective communication with them because this knowledge and attitude can affect their compliance to the completion of vaccination.

Acknowledgments

The authors would like to thank, Mr. Azrin Shah Abu Bakar who had contributed to this study. The authors would also like to thank all staff involved in the study for their support and cooperation.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The author(s) reported there is no funding associated with the work featured in this article.

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