ORIGINAL ARTICLE

Knowledge and Attitude of Immunization among IIUM Pharmacy Students

Omer Qutaiba B Allela

College of Pharmacy, University of Duhok, Duhok, Kurdistan Region, Iraq

ABSTRACT

Background and Aim: This study sought to explore International Islamic University Malaysia (IIUM) third-year pharmacy students' knowledge and attitudes regarding immunization using a questionnaire. **Method:** A cross-sectional prospective survey was carried out among 89 students to obtain demographic data. Other data were collected using knowledge and attitude immunization questionnaires consisting of twenty questions related to knowledge and five questions related to attitude and practice. The final questionnaire was subsequently discussed among specialist pharmacists who are experts in this field and who judged the face and content validity of the questionnaire. Descriptive statistics were used and internal consistency was tested using Cronbach's alpha coefficient. **Results**: Employing the recommended scoring method, the mean+standard deviation of the knowledge and attitude scores was 11.7614 ± 3.30445. Cronbach's alpha test for internal consistency was 0.582 for the 25 items in the knowledge and attitude questionnaire. **Conclusion**: The study concluded that the knowledge and attitude immunization questionnaire appears to be reliable and valid for measuring knowledge, attitude, and practices among third-year pharmacy students at IIUM. It can be used in future research as it was suitable to determine the knowledge and attitudes regarding immunization among pharmacy students.

Key words: Knowledge, attitude, immunization, pharmacy students

Correspondence:
Omer Qutaiba Bader Aldeen Allela,
Clinical Pharmacy Department, College of Pharmacy, University of Duhok, Duhok, Kurdistan Region, Iraq.
E-mail: omarallela@yahoo.com

Access this article online

Website: www.jbclinpharm.org

Quick Response Code:

INTRODUCTION

The World Health Organisation (WHO) states that many children die all over the world especially in developing nations due to measles, hepatitis B, Haemophilia influenza, whooping cough (pertussis), tetanus, diphtheria and polio.[1] Children have a low level of immunity due to an undeveloped immune system. Therefore, children are more prone to microbial infection. Children need to be immunised at a certain age, in order to ensure that they have a good ability to fight against infection.

Immunization is one of the public health programmes that prevent disease in society. Vaccination is the most common technique used in immunization. It entails the administration of a vaccine into the human body in order to stimulate an individual's immune system against bacteria, viruses, parasites and fungi. Vaccines are defined as biological preparation intended to produce immunity against a disease by exciting the production of antibodies. Vaccines are safe and effective; however, adverse reactions may develop following a vaccine and the process of immunization itself.[2]

In certain cases, adverse effects and misconceptions about vaccines cause some parents to reject the vaccination programme. Hence, the role of health care providers is very important in determining the decision making of parents regarding vaccination. According to Philip *et al.*, '5.7% of parents thought that vaccines were not safe, and 21.5% said that their decision to vaccinate their children was not influenced by a health care provider. Meanwhile, parents who influenced by the health care providers were twice as likely to state positively that vaccines were safe for children. In order to overcome this rejection, the health care providers need to follow the guidelines to communicate with parents who refuse to vaccinate their children.[3] They should respect and listen to the parent's decision and, at the same time, help them to have the right information by providing knowledge about the risks and benefits of vaccines. Philip *et al.* stated that medical professionals should provide best practices such as lessening the pain, reducing the number of injections per visit and professional advice to increase parents' confidence.

Pharmacists have long been recognised in clinical practice as one of the most trusted and accessible health care providers.[4] They have a unique position and role in order to promote vaccinations. There are six practices that can be done by pharmacists, including reviewing history and screening, patient counselling, documentation, formulary management, administrative measures, and public education.[5] Thus, in order to provide excellent practice, pharmacists need to be knowledgeable, up-to-date and understand many issues related to vaccines like different types of formulary and side effects including all the controversial issues, for example: halal vaccine and non-halal vaccine. In short, currently the immunity level of a community is highly dependent and influenced by health care providers especially pharmacists. Pharmacy students who will be health care providers should have high knowledge and good attitudes regarding immunization so that they can improve parents' understanding of vaccines. After all, the parents will decide whether to vaccinate their children or not.

METHODS

Development of the questionnaire

The questionnaires were developed in English to maintain consistency of questions that were adapted from previous research.[6-21] There were a total of 25 questions on knowledge and attitude regarding immunization among IIUM pharmacy students. No additional questions were added. Overall, 20 questions concerned knowledge and the remaining 5 questions were about attitude.

Data collection

The questionnaire consisted of two parts: part A and part B. The first part (part A) covered demographic data including student's personal data,

Cite this article as: Allela OQB. Knowledge and Attitude of Immunization among Iium Pharmacy Students. J Basic Clin Pharma 2017;8:S65-S69.

family data, parent's education and family income data. The second part (part B) consisted of the knowledge and attitude questionnaire (20 questions on knowledge and 5 questions on attitude). This prospective study was carried out with third year IIUM pharmacy students. The questionnaire forms were intended to be filled out by 90 students. However, only 89 complete forms were collected and analysed. Data collection was done within a day and students that attended class on that particular day answered the questionnaires. The questionnaires were distributed among third year IIUM pharmacy students in a class during recess time. They were given enough time to answer the questionnaires related to their knowledge and attitude towards immunisation. The questionnaires were in English.

Validation study

The final questionnaire was subsequently discussed among specialist pharmacists who are experts in this field and who judged the face and content validity of the questionnaire.

Statistical analysis

Microsoft Excel was used to tabulate the data, which were further analysed using Statistical Package for Social Sciences (SPSS) 20 for Windows. The percentages and frequencies of available students, gender, state of origin, demographic distribution, fathers and mother's education and family income (categorical variables) were evaluated. Means and standard deviations were calculated for age, number of preschool children in the family, number of siblings, student order in family and knowledge and attitude scores (continuous variables). In order to assess knowledge, attitudes and practices, the following scores were used: 1=yes; 0=no or not sure. Overall mean and median scores were calculated for each student and statement. The maximum possible score was 25. Discrete data were analysed using the Kruskal-Wallis and Mann-Whitney tests for non-parametric distribution. P-values<0.05 were considered significant. In order to test reliability, the internal consistency and corrected item-total correlations were assessed using Cronbach's alpha.

RESULTS

Demographic data

A total of 89 students were analysed. The majority of students were female (70.8%) and most students were 22 years old (80.9%). A majority of students lived in urban areas (66.3%). About 20.2% (n=18) were from the state of Selangor [Table 1]. The remaining variables are described in Tables 2 and 3.

Reliability

The mean ± standard deviation of knowledge and attitude scores was 11.7614 ± 3.30445. Cronbach's alpha test for internal consistency was 0.582 for the 25 items in the questionnaire. The item-total correlations are shown in Tables 4 and 5. Questions 15, 17 and 19 had the lowest corrected item-total correlation value among 25 questions. When these three questions were eliminated, Cronbach's alpha increased to 0.599.

Multivariate analysis

The level of knowledge among the students was positively associated with their attitude towards immunisation. Based on the Kruskal-Wallis test, Students' scores in knowledge and attitude towards immunisation were highest when the fathers' education level was high (p=0.009). Meanwhile, other parameters were not significant in determining the students' knowledge and attitude scores.

DISCUSSION

The questionnaire was developed to evaluate knowledge and attitude of third year pharmacy students in IIUM. The questionnaire was

Table 1: Demographics data of students

Parameter (n=89)		Frequency	%
Gender	Male	26	29.2
	Female	63	70.8
Age	21	10	11.2
	22	74	82.1
	23	6	6.7
Demographic Distribution	Urban	59	66.3
	Rural	30	33.7
State of origin	Perlis	1	1.1
	Kedah	5	5.6
	Pulau Pinang	4	4.5
	Perak	12	13.5
	Selangor	18	20.2
	N9	3	3.4
	Johor	5	5.6
	Pahang	4	4.5
	Terengganu	14	15.7
	Kelantan	16	18.0
	Sarawak	1	1.1
	Kuala Lumpur	6	6.7

Table 2: Family data

Parameter		Frequency	Percent
Preschool children	0.00	85	95.5
	1.00	1	1.1
	3.00	1	1.1
	4.00	2	2.2
Siblings number	1.00	1	1.1
	2.00	2	2.2
	3.00	18	20.2
	4.00	12	13.5
	5.00	29	32.6
	6.00	12	13.5
	7.00	6	6.7
	8.00	5	5.6
	9.00	2	2.2
	10.00	2	2.2
Father education	Primary	5	5.6
	Secondary	33	37.1
	Undergraduate	51	57.3
Mother education	Primary	6	6.7
	Secondary	47	52.8
	Undergraduate	36	40.4
Family income	<1000	7	7.9
	1000-2000	12	13.5
	2001-3000	11	12.4
	3001-4000	17	19.1
	>4001	42	47.2

Table 3: Cronbach alpha and descriptive statistics

Scale	Cronbach α	Mean	SD	Median	Maximum	Minimum
KAP total	0.582	11.7614	3.30445	11.00	20.00	3.00

Table 4: Reliability test of 25 questions of knowledge and attitude scale

	Item-Total Statistics			
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	11.0114	10.448	0.100	0.581
Q2	11.1136	9.964	0.239	0.563
Q3	11.3750	9.455	0.406	0.538
Q4	11.2045	9.843	0.264	0.559
Q5	11.0114	10.126	0.218	0.567
Q6	11.4659	10.229	0.164	0.574
Q7	10.8636	10.901	-0.037	0.591
Q8	11.2045	10.325	0.107	0.582
Q9	11.4886	9.678	0.373	0.546
Q10	11.2500	10.236	0.134	0.578
Q11	11.4205	9.833	0.287	0.556
Q12	11.3864	10.516	0.053	0.589
Q13	11.4205	9.580	0.377	0.544
Q14	11.4205	9.925	0.256	0.561
Q15	11.6364	10.924	-0.052	0.594
Q16	11.1023	10.047	0.214	0.567
Q17	11.6477	11.058	-0.113	0.599
Q18	11.2386	10.529	0.042	0.591
Q19	11.6364	10.993	-0.083	0.597
Q20	11.5568	10.411	0.132	0.577
Q21	11.6136	10.424	0.160	0.574
Q22	11.3636	10.073	0.193	0.570
Q23	10.9545	10.251	0.201	0.569
Q24	10.9886	10.011	0.274	0.560
Q25	10.8977	10.185	0.279	0.562

Table 5: The list of questionnaires with its percentage values

Question		Correct answer (%)	Incorrect answer (%)
1.	A vaccine is a medical treatment in which dangerous viruses and bacteria are killed or modified and then put into your body.	74.16	25.84
2.	Active immunization is a killed or weakened form of disease-causing agent.	65.17	34.83
3.	Passive immunization is an antibody from someone who was infected with the disease.	38.20	61.80
4.	Vaccines have not substantially changed the incidence of any major infectious disease	56.18	43.82
5.	Vaccines actually cause more disease than they prevent	75.28	24.72
6.	Vaccines are amongst the most effective and least costly forms of medical treatment.	29.21	70.79
7.	The reason vaccines are given regularly to children is that they result in lifelong protection from several serious diseases.	89.89	10.11
8.	Vaccination is for all age.	56.18	43.82
9.	initiation of potential routine immunization schedule should be on the first day	26.97	73.03
10.	Vaccines should never be given to infants under 1 year of age	51.69	48.31
11.	Children younger than 2 years received more than 70% of immunization doses.	33.71	66.29
12.	BCG is the first immunization dose against TB	37.08	62.92
13.	Vaccine needed to be stored at temperature more than 8'C and do not freeze.	34.83	65.17
14.	The product should be used within 72 hours of the seal broken.	33.71	66.29
15.	Vaccines is harmful	12.36	87.64
16.	The risk of a few adverse reactions to vaccines is acceptable if the majority of the population is protected against infectious disease	65.17	34.83
17.	Fever is one of the important contraindication in child immunization	11.24	88.76
18.	If the child receives extra immunization, it is more effective and safer.	52.81	47.19
19.	If child receive immunization dose before appropriate time for immunization, this dose will be repeated.	12.36	87.64
20.	The CDC recommended that all adult receive annul(annual) influenza vaccination	21.35	78.65
21.	Is it possible to get influenza from the influenza vaccine?	15.73	84.27
22.	Influenza vaccine is safe for children 6 months to 18 years and adult	40.45	59.55
23.	Vaccines are necessary	79.78	20.22
24.	Are you in favour of vaccination in general?	76.40	23.60
25.	Will you recommend vaccination to others?	85.39	14.61

developed by adapting previous questionnaires with consideration of the target sample group. It had two types of continuous questions, with 25 items for knowledge and attitudes. The reliability of the knowledge and attitude questionnaire was verified using Cronbach's alpha to measure the internal consistency and the validity of the questionnaire was determined. Cronbach's alpha was used to estimate the proportion of variance that is systematic or consistent in a set of test scores.[22] Cronbach's alpha is a test for reliability that requires only a single test administration to provide a unique estimate of reliability for a given test. It also provides the average value of the reliability coefficient that would be obtained for all possible combinations of items when split into two half-tests.[23] In other words, the value of Cronbach's alpha determines whether the instrument used will always elicit consistent and reliable responses even if the questions were replaced with other similar questions for the same respondent. It ranges between 0 and 1 and the coefficient which is closer to 1.0 has the tendency for greater internal consistency of the item in the scale although this value is dependent on the number of items in the scale. The questionnaire had an internal consistency of 0.582. Scale scores are considered acceptably reliable for group comparisons with internal consistency estimates above 0.7.[17] However, according to study in 2011, they were still considered sufficient because the internal consistency was greater than 0.5.[17]

However, Cronbach's alpha cannot provide a reliability estimate for single items. The Cronbach's alpha coefficient for the questionnaire developed in this report marginally passed the acceptable criteria which is above 0.5 but still a poor value, indicating possible higher risk for error when analysing data.[24] Moreover, possible improvement can be achieved using a Likert scale approach and increasing the length of the test or number of questionnaires. When identifying the independent variables that affect the dependable variables – the knowledge and attitude of pharmacy students on immunisation, extensive reading constructed for a few possible variables including age, ethnicity, location (rural or urban), state origin, parent's education and family income. The sample (third year students) taken from the population (IIUM Kulliyah of Pharmacy), were born between 1989 to 1991.

The results showed no significant ($p>0.05$) relationships between gender, age of respondent, location (rural or urban), mother's education, family income and knowledge and attitude towards vaccination. However, there was a significant ($p<0.05$) relationship between father's education and knowledge and attitude towards vaccination. The documented immunisation schedule for children under 18 years old includes the frequency and intensity of the government's effort to improve overall health. Statistics have shown a steady decline in the infant and children mortality rate since 1970. The Malaysia millennium development goal (MDG) targeted a two-thirds reduction of child mortality between 1990 and 2015 from both urban and rural areas of all ethnicities and dispersed equally between all states. However, there are no available studies that specifically focussed on immunisation and vaccination in Malaysia but rather reported on general health. In addition, research conducted by Angellilo *et al.* found that parent's (especially mother's) awareness towards mandatory vaccination for infants (poliomyelitis, tetanus, diphtheria and hepatitis B) is affected by higher education level and older age at child's birth. Subsequently, the variables mentioned indirectly impacted the level of exposure of the respondent which later should influence the degree of knowledge and attitude.[25]

The mean ± standard deviation level of knowledge and attitude of third year pharmacy students was 11.7614 ± 3.30445 which is considered low. This is because third year pharmacy students do not receive formal education on vaccination topics. Therefore, students are unaware of its importance, possible side effects, schedule, and storage condition. Apart from that, they are not exposed to their future role of pharmacist as a health care provider. Environment factors such as family education as well as media promotions are also crucial in increasing student's knowledge.

The knowledge and attitude score of third year IIUM students is low which can be linked to insufficient formal exposure to the subject. The findings are similar to other studies which show extraordinarily poor mean knowledge.[26] Low level of knowledge can result in low acceptance of vaccinations. In some studies, lack of knowledge is the main reason for not being vaccinated.[27,28] This is contradicted in a study which showed knowledge did not contribute to acceptance of vaccination compared to cost and safety concerns.[29]

On the other hand, some studies showed high level of knowledge and attitude scores among students towards vaccination.[30] In another study, mean score of knowledge and attitude was high but there was a low correlation between knowledge and attitudes towards acceptance of vaccinations.[31] Negative attitudes will develop with inadequate knowledge of vaccinations, including its purposes, functions and side effects. Anti-vaccination attitudes will develop if the knowledge of vaccination is based on informal knowledge.[22] A study measuring vaccination acceptance among college students in Canada revealed that they need tools to personalise information because if it is absent, they are not able to apply the knowledge to benefit their health.[32] In both studies, lack of valid sources of knowledge cause negative attitudes towards vaccination. Almost all studies concluded that formal education is important to increase level of vaccination awareness in students.

Limitations

The sample size used in this study was small and restricted to third year pharmacy students.

CONCLUSION

Based on the data analysis, father's level of education has an important role in the respondent's knowledge and attitude towards immunisation. The reasons behind this are rather bleak such as being responsible as a leader of the household to provide the best accommodation which also involves consent and support of immunisation programme, known or informed of risk including disease mortality in children with or without immunisation and consistent or adherent in completing the immunisation schedule. Due to the fact that the study only assessed a single sample, the assessment should not rule out other variables as contributing factors.

REFERENCES

1. Ritvo P, Irvine J, Klar N. A Canadian national survey of attitudes and knowledge regarding preventive vaccines. J Immun Based Therap Vacc 2003;1:3.
2. WHO. Immunization safety surveillance: Guidelines for managers of immunization programmes on reporting and investigating adverse events following immunization. WHO Regional Office for the Western Pacific Manila 1999.
3. Smith PJ, Kennedy AM, Wooten K, Gust DA, Pickering LK. Association between health care providers' influence on parents who have concerns about vaccine safety and vaccination coverage. Pediatri 2006;118:e1287-92.
4. Rothholz MC. The role of community pharmacies/pharmacists in vaccine delivery in the United States. Presentation to ACIP June.
5. Shortell SM, Bennett CL, Byck GR. Assessing the impact of continuous quality improvement on clinical practice: what it will take to accelerate progress. Milbank Quarterly 1998;76:593-624.
6. Myers AL, Lantos J, Douville L, Jackson MA. Healthcare worker knowledge and attitudes regarding influenza immunization and childhood vaccination. Inf Control and Hospital Epidemiolo 2010;31:643-6.
7. Allela O, Bahari M, Alabbassi M, Basher A. PIN38 right immunization doses received by pediatric younger than 2 years. Value in Health 2011;14:A120-A.
8. Allela O, Bahari M, Alabbassi M, Basher A. PIN37 how many immunization doses were missed in pediatrices younger than 2 years? Value in Health: Elsevier 2011:A120-A.
9. Allela O, Bahari M, Alabbassi M, Basher A. PIN39 immunization barriers and suggested solutions in Iraq. Value in Health 2011;14:A120-A1.

10. Alblela O, Bahari M, Alabbassi M, Saleh M, Basher A, Shafie A, *et al.* PIN88 Late Immunization Doses Received by Children Younger than Two Years. Value in Health 2011;14:A281.
11. Allela O, Bahari M, Alabbassi M, Salih M, Basher A. PIH4 Immunization Status and Families' Factors in Iraq. Value in Health 2012;15:A638.
12. AlLela O, Bahari M, Alabbassi M, Salih M, Basher A. PIH9 Assosiation Between Health Care Providers and Immunization Compliance in Iraq. Value in Health 2012;15:A639.
13. AlLela O, Bahari M, Al Abbassi M, Salih M, Basher A. Iraqi parents' views of barriers to childhood immunization. EMHJ 2013;19:295-7.
14. AlLela OQ, Bahari MB, AlAbbassi MG, Salih MR, Basher AY. Estimation of immunization providers' activities cost, medication cost, and immunization dose errors cost in Iraq. Vacci 2012;30:3862-6.
15. Allela OQ, Bahari MB, Alabbassi MG, Salih MR, Basher AY. Influence of health providers on pediatrics' immunization rate. J Tropic Pediatri 2012;58:441-5.
16. Allela OQ, Bahari MB, Salih MR, Alabbassi MG, Elkalmi RM, Jamshed SQ, *et al.* Factors underlying inadequate parents' awareness regarding pediatrics immunization: findings of cross-sectional study in Mosul-Iraq. BMC Pediatri 2014;14:29.
17. Allela OQB, Bahari MB, Alabbassi MG, Basher AY. Development of a questionnaire on knowledge, attitude and practice about immunization among Iraqi parents. J Pub Health 2011;19:1-7.
18. AlLela OQB, Bahari MB, AlQazaz HK, Salih MR, Jamshed SQ, Elkalmi RM, *et al.* Are parents' knowledge and practice regarding immunization related to pediatrics' immunization compliance? a mixed method study. BMC Pediatri 2014;14:20.
19. Allela OQB, Bahari MB, Elkalmi RM, Awadh AIJ. Incorporating an immunization course in the pharmacy curriculum: malaysian experience. Am J Pharmaceut Educ 2012;76.
20. Awadh AI, Hassali MA, Allela OQ, Bux SH, Elkalmi RM, Hadi H, *et al.* Immunization knowledge and practice among Malaysian parents: a questionnaire development and pilot-testing. BMC Pub Healt 2014;14:1107.
21. Awadh AI, Hassali MA, AlLela OQ, Bux SH, Elkalmi RM, Hadi H, *et al.* Does an educational intervention improve parents' knowledge about immunization? Experience from Malaysia. BMC pediatri 2014;14:254.
22. Busse JW, Kulkarni AV, Campbell JB, Injeyan HS. Attitudes toward vaccination: a survey of Canadian chiropractic students. Canadian Med Associ. J 2002;166:1531-4.
23. Pharmacists ASoH-S. ASHP guidelines on the pharmacist's role in immunization. Am J Healt-System Pharm 2003;60:1371-7.
24. Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ 2011;2:53.
25. Angelillo I, Ricciardi G, Rossi P, Pantisano P, Langiano E, Pavia M, *et al.* Mothers and vaccination: knowledge, attitudes, and behaviour in Italy. Bulletin of the World Health Organ 1999;77:224-9.
26. Maroof KA, Bansal R, Parashar P, Sartaj A. Do the medical, dental and nursing students of first year know about hepatits B? A study from a university of North India. J Pak Med Associ 2012;62:25.
27. Machowicz R, Wyszomirski T, Ciechanska J. Knowledge, attitudes, and influenza vaccination of medical students in Warsaw, Strasbourg, and Teheran. Eur J Med Res 2010;15:235.
28. Ramsey MA, Marczinski CA. College students' perceptions of H1N1 flu risk and attitudes toward vaccination. Vacci 2011;29:7599-601.
29. Giede C, McFadden LL, Komonoski P, Agrawal A, Stauffer A, Pierson R, *et al.* The acceptability of HPV vaccination among women attending the University of Saskatchewan Student Health Services. J Obstetr Gynaecolo Cancer 2010;32:679-86.
30. Lerais I, Durant M, Gardella F. Assessment of students' knowledge, opinions and behaviours about Human Papilloma Virus (HPV), France, Alpes-Maritimes, 2009. Bulletin Epidémiologique Hebdomadaire 2010:97-100.
31. Bendik MK, Mayo RM, Parker VG. Knowledge, perceptions, and motivations related to HPV vaccination among college women. J Cancer Educ 2011;26:459-64.
32. Elit L, Trim K, Mohan R, Nastos S, Harnish D. The knowledge and attitudes of university students concerning HPV vaccine and cervical screening. Clin Med Insights Reprod Health 2009;3:1.