Knowledge and Attitudes of Vaccination among Iraqi Pharmacy Students

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Abstract

Objective: Since the vaccination rate is largely affected by low knowledge and negative attitudes of healthcare professionals, so this study aimed to weigh up the vaccination knowledge and attitudes of pharmacy students.

Method: A pilot study using a survey to investigate demographic data, knowledge (20 questions), and attitudes (5 questions) of 156 fifth year and 121 third year pharmacy students from College of Pharmacy/ University of Baghdad.

Results: The mean score of knowledge and attitudes was intermediate (16.654 and 14.917 out of 25 for the fifth and the third grades, respectively) with a significant difference between the two groups, the students shown to have favorable attitudes about vaccination. The score of the students is not influenced by family-related parameters like father's education, mother's education, the number of siblings and preschool children in the family.

Conclusion: A positive attitude and intermediate knowledge level about vaccination among pharmacy students were found. This could be improved by the addition of a specialized vaccinology course to the curriculum in pharmacy colleges and schools in Iraqi universities and going toward implementing the pharmacy-based immunization program for pharmacists by the health authorities which in turn can develop pharmacists' role in the healthcare system in Iraq.

Keywords: *Knowledge, attitudes, pharmacy students, vaccination.*

Introduction

Immunization involves the administration of vaccines to individuals in order to develop immunity against any specific disease. The World Health Organization (WHO) states that vaccines are biological substances that are either single substance specified for one disease, combined vaccines in one preparation that immunize the person against more than one disease or they can be live attenuated or weakened viruses that cause mild infection creating immunity against that virus. Immunization may involve the occurrence of a medical incident called the adverse event following immunization (AEFI) that may concern the vaccinated individuals. Controlling AEFIs and monitoring the safety of vaccines will increase immunization programs' credibility[1]. There are wrong concepts about vaccination owned by parents that affect their decisions to vaccinate their children; also some of them have hesitation to take vaccines due to safety issues[2]. This misconception may come from the possible relation between vaccines and different diseases such as Crohn's disease, multiple sclerosis and autism and the possibility that they can cause diseases which thought

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to be vaccines associated[3]. Healthcare professionals' knowledge and attitudes toward vaccination can affect the patients' decision to vaccinate[4]. Misconceptions among healthcare workers may restrain vaccination process, since low level education and training about vaccination may lead to low rates of vaccination especially in people who are misinformed[5]. Pharmacists are able to take a fundamental responsibility in the vaccination administration to decrease vaccine-preventable deaths since they have a unique placement in community pharmacies with long working hours and being available on weekends[6]. It's more likely for patients to receive vaccines from educated and incited pharmacists rather than from a non-incited one [7]. The development of the practice zone of pharmacists as immunizers has encouraged adult vaccination by community pharmacies [8]. Still, reports from pharmacists about their needs to be well informed about the diseases and vaccinations so that they are able providerequired consultations and education to the parents and the patients[9].

As a result, it is vital to guarantee that pharmacists have the required updated knowledge regarding vaccination[4], and the pharmacy students as the future healthcare providers should have the necessary knowledge and attitudes toward vaccination, so it's possible for them to improve the information and conception of the parents so they can make the child vaccination decision[10]. This study is aimed to evaluate the knowledge and attitudes of pharmacy students toward vaccination.

Materials and Method

Study Design: A pilot study included a questionnaire according to literature[10]. The study instrument has been designed and validated by authors[10], and used in our study toexplore the knowledge and attitudes of pharmacy students toward vaccination. The questionnaire composed of two parts: The first one investigated the demographic data, such as gender, age, and family data which include parents' education and the number of pre-school children. The second part contained the attitude and knowledge survey which included five questions about the attitude and twenty questions about the knowledge. The questionnaire was administered (in English) to the fifth (final) and third year students in the College of Pharmacy/University of Baghdad during the academic year 2018/2019 in November and December/2018.

Ethics: The students participated in this study expressed voluntary approval to be included when they filled and returned the survey and they are all of age (older than 18). The questionnaire did not contain any personal identifiers during the distribution and collection process.

Statistics: The data was arranged and saved using Microsoft Excel. Frequencies and percents were used to describe categorical variables; these include the frequency of responses for the knowledge and attitude expressed as correct and wrong answers. Age and knowledge and attitudes score were presented as means and standard deviations (continuous variables). To calculate knowledge and attitudes' score, correct answers =1; wrong answers =0 values were used and the overall score for each student then the score for all students were calculated. The maximum score that can be obtained equals 25. Windows Statistical Package for the Social Sciences (SPSS) 20 has been used for advance data analysis. Continuous variables (age) have been analyzed by Man-Whitney test for non-parametric distribution, while the association between discrete variables (gender, parents' education, the siblings' number and preschool children's number) and the significance of differences in the knowledge and the attitudes' questions among the two groups have been analyzed by Chi square test for independence. P-values<0.05 were considered to be significant.

Results

A total of 277 students out of 330 completed the questionnaire (156 students out of 180 from the fifth grade and 121 students out of 150 from the third grade with response rate 86.7% and 80.7% respectively). The majority of students were females for both groups with a non significant difference between the two groups. The age range for the fifth grade was between 22 and 24 years with a mean age of (22.5±0.6) years old, while for the third grade was between 20 and 22 with mean age of (20.6±0.7) with a significant difference between them. The remaining variables are described in table (1), presented as numbers and percents with a non significant difference between the two groups. Mean knowledge and attitudes' score was 16.654 and 14.917 out of 25 for the fifth and the third grade respectively. The responses to the study questionnaire are presented in table (2). The knowledge and attitudes of the students are not influenced by parameters like father's education, mother's education, the number of siblings and

preschool children in the family (these parameters have no significant effect in determining the knowledge and attitudes of the students with P-value of 0.600, 0.355, 0.484 and 0.402 respectively).

Table 1: The students' demographic data.

	Parameter		**Fifth grade**	**Third grade**	**P-value**
1	Age: Mean ±SD		22.5±0.6	20.6±0.7	0.000
2	Gender: n (%)	Female	112(71.8%)	93(76.9%)	0.340
		Male	44(28.2%)	28(23.1%)	
3	Father Education: n (%)	Primary	22(14.1%)	19(15.7%)	0.710
		Secondary	134(85.9%)	102(84.3%)	
4	Mother Education: n (%)	Primary	29(18.6%)	28(23.1%)	0.275
		Secondary	127(81.4%)	93(76.9%)	
5	Brothers and sisters' number: n (%)	1	21(13.5%)	18(14.9%)	0.480
		2	87(55.8%)	76(62.8%)	
		3	39(25%)	22(18.2%)	
		4	9(5.7%)	5(4.1%)	
6	Preschool children's number: n (%)	0	123(78.9%)	113(85.1%)	0.399
		1	30(19.2%)	16(13.2%)	
		2	3(1.9%)	2(1.7%)	

The responses are presented as numbers and percents.

Table 2: The knowledge and attitudes of Iraqi pharmacy students toward vaccination.

	Questions	**Fifth grade (n:156) Correct answers: n (%)**	**Third grade (n:121) Correct answers: n (%)**	**P-value**
1	Vaccine is a medical treatment contains killed or modified dangerous viruses and bacteria to be put into the body.	115 (73.72%)	97 (80.2%)	0.209
2	A disease causative agent that is killed or weakened is called active immunization.	128 (82.05%)	74 (61.2%)	<0.001
3	The antibody from person was infected with the disease is called passive immunization.	131 (83.97%)	69 (57%)	<0.001
4	The occurrence of any major infectious disease has not changed significantly by vaccines.	121 (77.56%)	93 (76.9%)	0.890
5	In fact, vaccines cause more disease than they prevent	135 (86.54%)	112 (92.6%)	0.110
6	Vaccines are from the most efficient and cheapest types of medical therapy.	109 (69.87%)	76 (62.8%)	0.216
7	Vaccines result in lifelong protection from many dangerous diseases; this explains why they are given for children on a regular basis.	140 (89.74%)	107 (88.4%)	0.727
8	Vaccination is for all age.	99 (63.46%)	71 (58.7%)	0.417
9	A feasible regular vaccination schedule should be started on the first day	99 (63.46%)	62 (51.2%)	0.041
10	Infants under 1 year of age should never receive vaccines.	82 (52.56%)	71 (58.7%)	0.310
11	More than 70% of vaccination doses are given for children younger than 2 years.	34 (21.79%)	21 (17.4%)	0.358
12	The first vaccination dose is BCG against Tuberculosis.	113 (72.44%)	83 (68.6%)	0.486

	Questions	Fifth grade (n:156) Correct answers: n (%)	Third grade (n:121) Correct answers: n (%)	P-value
13	The vaccine should not be freeze and their storage should be at a temperature above 8ºC.	94 (60.26%)	49 (40.5%)	0.001
14	After the seal is opened, the vaccine should be used within 72 hours.	65 (41.67%)	42 (34.7%)	0.238
15	Vaccines are harmful.	75 (48.08%)	53 (43.8%)	0.479
16	In case most of the population acquires protection against infections, the hazard of a few vaccines' adverse reactions is acceptable.	132 (84.62%)	76 (62.8%)	<0.001
17	One significant contraindication in child vaccination is fever.	103 (66.03%)	68 (56.2%)	0.095
18	It is more effective and safer for the child if given extra vaccination.	74 (47.44%)	38 (31.4%)	0.007
19	If vaccination dose was given to the child before the proper time, it will be repeated.	103 (66.03)	63 (52.1%)	0.019
20	The CDC (the Center for Disease Control and Prevention) recommends a yearly adult influenza vaccination.	54 (34.62%)	27 (22.3%)	0.026
21	Is it likely to have influenza as a result of the influenza vaccine?	73 (46.80%)	59 (48.8%)	0.745
22	The influenza vaccine is considered to be safe for children (with ages between 6 months and 18 years) and adults.	115 (73.72%)	79 (65.3%)	0.129
23	Vaccines are necessary	142 (91.02%)	114 (94.2%)	0.320
24	Are you in favor of vaccination in general?	126 (80.77%)	103 (85.1%)	0.342
25	Will you recommend vaccination to others?	136 (87.18%)	98 (81%)	0.158
	Mean knowledge and attitudes score	16.654	14.917	0.009

The responses are presented as numbers and percents.

Discussion

Overall, this study showed that the final year pharmacy students have positive attitudes toward vaccination with a non significant difference between fifth and third grade pharmacy students. According to the WHO immunization Strategic Advisory Group of Experts, the uncertainty about vaccination is largely growing and attitudes and viewpoints of health professionals are from the objective factors that determine it [(11)].

Many studies stated that positive attitudes of professionals in healthcare system have been realized to be associated with elevated vaccination rates [(12,13)]. Additionally, the recommendation of vaccines by healthcare professionals arises mainly from their belief that vaccines are beneficial and their professional obligation and requires patients´ trust in healthcare workers [(14)].

Other studies have shown that health professionals are considered a determinant factor for parents and other persons affecting themselves and their children's vaccination decisions[(15,16)]. Especially after the conflict against vaccination started a few years ago and resulted in hesitation and unwillingness of parents toward children's vaccination due to adverse effects and safety concerns[(17)], and claimed associations of vaccines to the occurrence of various diseases[(3)].

Healthcare professionals' vaccination knowledge can affect the vaccination decision, since badly informed caregivers may create obstacles against obtaining coverage of vaccination within a population [(4)]. Furthermore,enlightened and provoked patients by their pharmacist seem to be more likely to receive vaccines[(7)]. So, ensuring that health workers realize the facts, effectiveness and safety of vaccines is vitally important [(4)]. Opportunity to optimize and lead immunization preparation from the beginning of professional education can be obtained by evaluation of awareness, attitudes and concerns of students starting their health care professional study [(14)].

In our study, the students' knowledge and attitudes have not been affected by various parameters like parents' education, the number of siblings and preschool children in the family for both groups. One study showed that the knowledge about vaccination to be affected by the father education[10].

The first five questions investigated the general knowledge about vaccination and the responses in two questions about passive and active immunization were significantly different between fifth and third year students. This can be attributed to the fact that third year students did not receive the courses of Immunology and Public health yet, which are included in the fourth year syllabus in Iraqi pharmacy schools.

As progressing to more specific questions, correct answers' percentage decreased, with some questions having wrong answers in a higher percentage than right ones. When analyzing the questions investigated children's vaccination, most questions have been answered correctly by both groups with a non significant difference between them, except the questions which talked about that the children receive 70% of vaccination within the first two years of life and the safety of extra vaccination, the answers were mostly wrong in both groups. On the other hand, the question regarding the storage of vaccines has been answered mostly correct by fifth year students and wrong by third year students with a significant difference between them, while the questions related to the use of vaccine after its opening, and the CDC influenza vaccine recommendation for all adults, most answers were incorrect by both groups.

The overall knowledge and attitude score were significantly different between the two groups with both groups having a moderate score value and a higher score for fifth year students. These findings are compatible with another study which showed poor mean knowledge among medical field students [18]. This level of knowledge may create a negative attitude toward vaccination as a result of misinformed healthcare workers about vaccine function, aim and adverse effects [19].On the contrary, some studies demonstrated an elevated score of knowledge and attitude toward vaccination among students [20]. Another study stated that the knowledge and attitude score was high but has a non significant impact on vaccinations' acceptance [21].

In this study, the score can be linked to the fact that there is no specific course in the college curricula about vaccination and to inadequate structured exposure of the topic. Consequently, pharmacy students are partially uninformed of its significance, associated side effects, timetable, and storage. In general, there is low knowledge of the essential information about vaccination about their future responsibilities of pharmacist as a healthcare supplier. More than 35 colleges of pharmacy, including private and governmental pharmacy faculties in Iraq [22], all of them follow the same courses' outlines without a specific vaccinology course, and this represents a determinant factor in the pharmacy students' vaccination knowledge deficiency.

Many studies support this fact; a study conducted in the USA revealed that pharmacy schools have an obligation to enhance pharmacy student education and to develop the pharmacist-in-training skills that will prepare pharmacists for such a duty [5].Other studies reported the pharmacists' needs to acquire knowledge[9], and recommended to include a vaccinology course into the undergraduate syllabus of health care professionals in order to develop their knowledge[23]. Accordingly, the implication of a vaccinology course in the curriculum of pharmacy schools in Iraq can significantly increase pharmacists' knowledge and improve their attitudes toward vaccination.

On the other hand, a huge number of pharmacists graduate each year and the number of registered pharmacists at the Syndicate of Iraqi Pharmacists has exceeded the pharmacist to population ratio recommended by WHO (1:2000) [22]. This led to larger percents of unemployment in the private sector among young pharmacists, in addition to a disguised unemployment among pharmacists in governmental jobs with a limited role of the pharmacists in the hospitals and community health centers, and no role in vaccines' administration, since the Iraqi Ministry of Health does not implement pharmacy-based immunization services.

As a result, implementing pharmacy-based immunization program by the Ministry of Health can offer great benefits by utilizing the large number of pharmacists and provide additional job opportunities in the private sector. As many studies confirmed the readiness of pharmacy students to participate in the pharmacy-based immunization service [24], and the fact that pharmacists have a remarkable role as instructors, implementers and immunizers, by which they can promote patients to be vaccinated and to enhance vaccination rates[25]. Another study investigated the implementation the training

program of national immunization, in which a significant impact was reported on the demonstrated knowledge and expertise of the competent students. Nevertheless, the purported pharmacy students' attitudes did not vary considerably[26].

The limitations are small sample size included in our study and the fact that it is confined to students from the College of Pharmacy/University of Baghdad, since students from other pharmacy schools in Iraq may reveal different outcomes. Further larger scale research is required, with students from different pharmacy schools around the country, to obtain more precise and representing results.

Conclusion

In summary, this study showed a positive attitude toward vaccination among pharmacy students, which is considered to be a good result when taking into account the general misconception appeared in recent years. Both fifth and third year students demonstrated an intermediate level of vaccination knowledge with significant difference and more score for fifth year students over third year students.

The addition of a specialized vaccinology course to the curriculum in pharmacy schools can improve their knowledge and attitudes. Furthermore, implementing the pharmacy-based immunization program by the health authorities can improve the future role of pharmacists in the healthcare system and help to utilize the increased numbers of pharmacists in Iraq.

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