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# Effect Education Program upon Science Teacher Knowledge about Immunity and Immunization in Primary School at Al-muthanna City

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**Abstract.** Background: Science teachers are the closest to health. Teachers must be aware of the transitional diseases prevalent within school setting. As well as to provide educational lessons on ways of transmission and reduce the incidence of infection and explain the importance of vaccines that consider primary prevention about transmission disease and this is done through coordination with the centers of primary health care in Iraq. Methods and material of Study: The study design for this study is quiz- experimental that conducted at education directorate in Al-Muthanna City, during March 5th 2018 to March 15th 2019, to determine of effect education program upon science teacher knowledge about immunization and immunity. A total of (78) Science instructors (males and females) were chosen from a cluster sample. Data was collected using a questioner format. The questioner validity it was determined by a panel of specialists in the field of research, while the reliability was determined via a pilot research done in (10) schools from April 8th to April 14th, 2018. Results: the study results indicate by their demographics data is ages (52%) are them (41- more than) years old within age group. In regards to gender, 79.5 percent of teachers were female. Nearly half of the teachers (48.7%) had received their education from the Institute. Regarding the address, most of teachers setting in the urban (91%). The majority of teachers (84.6%) were married, according to their marital status. Regarding employee status, most of teachers (82.1 %) were permanent employee. Also, there are significant and different between pre and post-test in our study results at p. value 0.001. Conclusion: through our study result can conclude, most of the study sample were age 41 years old and female and have level of education is institute and live in urban area. The study sample have little knowledge about immunity and immunization, so all the teacher science need to education program to elevate of awareness about immunization and immunity for communicable disease. Recommendation: The study suggests that the Ministries of Health and Education work together to develop a standardized book for primary schools about infectious diseases and how to avoid and manage them through vaccination and immunity. Increase the number of science instructors who are enrolled in training sessions on communicable illness prevention for all primary school teachers.

**Keywords.** Immunity, Immunization, Vaccine preventable disease, Vaccine hesitancy.

## INTRODUCTION

Contagious diseases produced by microorganisms penetrating the body and infecting it with pathogens. Those diseases that can be transferred from one person to another, possibly directly or indirectly, are known as communicable diseases. Infectious disorders that regularly affect children are generally contagious and can easily transmit from one person to another. <sup>(1)</sup>

Immunity refer to a host's capacity to oppose a specific irresistible disease- causing operator. This happens when the body frames antibodies and lymphocytes that respond with the outside antigenic particles and render them innocuous. For general wellbeing nursing, this idea has hugeness in figuring out which people and gatherings are secured against illness and which might be helpless <sup>(2)</sup>. Immunization has greatly improved

and maintained the children health around the world by preventing or significant decrease the amount of incidence of certain pediatric illnesses, as well as lowering the average child mortality rate. <sup>(3)</sup>. Vaccines benefit not just the children who receive them, but also the healthcare system as a whole, which must pay for infection treatment on a regular basis. Immunizations are also important in developing "crowd resistance" a population afflicted with diseases. Crowd invulnerability is a collection of people's resistance for being attacked by a condition that is infectious when a sufficiently a considerable part of the population is resistant to the diseases, Even those who are not immune are protected from infection because their chances of contracting the disease are greatly lowered. <sup>(4)</sup>Science instructors are experts in their fields and the most health-conscious. Teachers must be aware of the transitional diseases prevalent within schools. As well as to provide educational lessons on ways of transmission and reduce the incidence of infection and explain the importance of vaccines and this is done through coordination with the centers of primary health care <sup>(5)</sup>.

## **METHODOLOGY**

This study was conducted using a quiz-experimental approach done at the Al-Muthanna City Education Directorate from March 5th 2018 to March 15th 2019, to see how an education program affected science teachers' understanding of immune & immunization. The total of (78) Science instructors (females and males) that been chosen from a cluster sample. The data was collected using a questioner format. The questioner has been valide by the panel of experts in the field, while the reliability were determined by the pilot study that done in ten schools that include (10) teachers which that excluded from the original samples, between April 8th and April 14th, 2018.

For data collection, It was decided to adopt a questionnaire format, which contained the two main aspects: The first section is about the sociodemographic features of teachers, such as gender and age, and level of education, address, marital status, Employee Status, years of experience, participation in training courses, and Teacher's specialty. The second section, which consists of (25) items, is about teachers' awareness of immunity and immunization. A descriptive statistical method (frequencies and percentages) is used, as well as an inferential statistical approach to assess the data statistically (Correlation Coefficient in confidence interval is 95 percent , and test chi-square).

## RESULTS

**TABLE 1.** Socio-demographic Descriptive of the study group

Socio-demographic	Groups	Freq.	Percent	Cum. Percent
Age	21-25	8	10.3	10.3
	26-30	2	2.6	12.8
	31-35	13	16.7	29.5
	36-40	14	17.9	47.4
	41- and more	41	52.6	100.
Mean 39.90± SD 9,01				
Gnder	Male	16	20.5	20
	Female	62	79.5	100
Level of Education	Preparatory	22	28.2	28.2
	Institute	38	48.7	76.9
	College	18	23.1	100.0
Residence	Urban	71	91.0	91.0
	Rural	7	9.0	100.
Marital status	Married	66	84.6	84.6
	Single	8	10.3	94.9
	other	4	5.1	100.
Employee Status	Permanent Employee	64	82.1	82.1
	Contract	8	10.3	92.3
	Daily wages	6	7.7	100.0
Experience	1-5	19	24.4	24.4
	6-10	3	3.8	28.2
	11-15	17	21.8	50.0
	16-20	16	20.5	70.5
	21 or More than	23	29.5	100.
Mean 14.96± SD 8.81				

Socio-demographic	Groups	Freq.	Percent	Cum. Percent
Training	Found	13	16.7	16.7
	Not Found	65	83.3	100.0
Teacher's specialty	Science teacher	58	74.4	74.4
	Competence is different	20	25.6	100.0

Table (1) shows that ages (52%) of them (41- more than) years old. In terms of gender, 79.5 percent of teachers were female. Nearly half of the teachers (48.7%) had received their education at the Institute. Regarding the address, most of teachers setting in the urban (91%). When it came to marital status, 84.6 percent of instructors were married. Regarding employee status, most of teachers (82.1 %) were permanent employee. (29%) of teachers had worked in the teaching field for 21 years or more. (83.3 percent) did not have the opportunity to participate in communicable disease control training. Furthermore, (74.4%) were getters certificates in science teacher.

**TABLES 2.** Descriptive statistics for the Teacher's Science knowledge and awareness toward immunity and immunization of the study sample.

Part I	Items	Pre-Test			Post-test		
		Ms.	R.S%	Ass.	M.s	R.S%	Ass.
1.	The ability of a person to prevent diseases when exposed to microorganisms is referred to as immunity	1.40	46.7	Inadequate	1.70	46.7	Inadequate
2.	Passive immunity and positive immunity are the two types of immunity.	1.08	36.0	Inadequate	1.92	64.0	Inadequate
3.	By mobilizing natural antibodies, passive or active immunity protects the body momentarily or for a brief period of time.	2.08	69.3	Adequate	3.00	100.0	Adequate
4.	Passive immunity is established spontaneously when antibodies are transferred through the placenta or breast - feeding from the mother to the fetus	1.88	62.7	Inadequate	2.8	78.7	Adequate
5.	that active immunity lasts longer in the body than negative passive immunity	2.32	77.3	Adequate	2.7	77.3	Adequate

Part I	Items	Pre-Test			Post-test		
		Ms.	R.S%	Ass.	M.s	R.S%	Ass.
6.	When the incidence of certain diseases or subclinical diseases, active immunity is naturally developed (which does not show symptoms and signs)	2.28	76.0	Adequate	2.5	76.0	Adequate
7.	Active immunity is a type of immunity that is created artificially when vaccines are administered in order to provide protection from disease.	1.20	40.0	Inadequate	1.20	40.0	Inadequate
8.	Immunity that has been established artificially by active or passive immunization	1.88	62.7	Inadequate	1.88	62.7	Inadequate
9.	Primary prevention effective method is a nationwide immunization program, which has resulted in individual and population immunity (General immunity)	2.00	66.7	Inadequate	3.00	100.0	Adequate
10.	Individual vaccination with anti-material (infectious agents or vaccine) is known as active vaccination, and it is generally defined by the host's production of anti-body	2.00	66.7	Inadequate	3.00	100.0	Adequate
11.	Active immunity can be seen in children who have been immunized against childhood illnesses.	1.88	62.7	Inadequate	2.52	84.0	Adequate
12.	Vaccines are substances that contain living, disabling, or etiologically slain pathogens or toxins in order to create antibodies that provide the body with effective immunity against particular diseases.	1.96	65.3	Inadequate	2.4	81.3	Adequate
13.	there are two vaccines: Vaccines are both optional and mandatory.	1.36	45.3	Inadequate	2.72	90.7	Adequate
14.	Tuberculosis vaccine, Mandatory vaccines include DPT + polio vaccine.	2.16	72.0	Adequate	2.48	82.7	Adequate
15.	that vaccinations against typhoid and smallpox, as well as rubella and mumps, are optional	1.08	36.0	Inadequate	2.76	92.0	Adequate

Part I	Items	Pre-Test			Post-test		
		Ms.	R.S%	Ass.	M.s	R.S%	Ass.
16.	Immune Person - A person who, as a result of previous disease or immunization, has unique protective antibodies or cellular immunity.	1.36	45.3	Inadequate	3.00	100.0	Adequate
17.	Diphtheria, tetanus, and whooping cough are all covered by the DPT vaccine.	1.48	49.3	Inadequate	1.48	49.3	Inadequate
18.	Vaccines for whooping cough, tetanus, polio, measles, rubella, and mumps with booster doses that must be received in children before attending school.	1.32	44.0	Inadequate	1.32	44.0	Inadequate
19.	During the school year, booster doses of rubella, mumps, viral hepatitis, and typhoid vaccine are given.	2.08	69.3	Adequate	2.08	69.3	Adequate
20.	Hepatitis A has a long incubation period, lasting 15 to 50 days before symptoms appear.	1.40	46.7	Inadequate	1.40	46.7	Inadequate
21.	Hepatitis B virus has a long incubation period, lasting 45 to 180 days before symptoms appear.	1.36	45.3	Inadequate	3.00	100.0	Adequate
22.	Typhoid disease has an incubation period of up to 1-3 weeks, depending on the amount of bacteria in contaminated food.	1.44	48.0	Inadequate	1.44	48.0	Inadequate
23.	Poliomyelitis has a 7-14 day incubation period.	2.24	74.7	Adequate	2.24	74.7	Adequate
24.	The incubation period for measles can last anywhere from 7 to 14 days.	2.04	68.0	Adequate	3.00	100.0	Adequate
25.	Pertussis has a 7-10 day incubation period.	1.84	61.3	Inadequate	2.44	81.3	Adequate

MS: Mean of score; Ass. : Assessment Adequate > 2 , An adequate less than or equal 2.

This table shows that Assessment of Knowledge items ( 3, 5 ,6,14,19,23,and 24) are Adequate for pretest group , while post-test group items (1,2,7,8,17,18,20,22) are inadequate. This result indicate that there is different between pretest and posttest for groups study.

**TABLE 3.** distribution of the study sample according to overall evaluation for two period of the study

Period of the study	Scale	Frequency	Percent	Mean of score	Assessment
Pre-Test	Fail	53	67.9	1.81	Fail
	pass	25	32.1		
	Total	78	100		
Post-Test	fail	27	34.6	2.11	Pass
	pass	51	65.4		
	Total	78	100		

This table indicate that the study results to different between pre and post test for overall evaluation is fail for pre-test and pass for post-test.

**TABLE 4.** Summery statistics for compression between pre -test one and post -test two according to Paired T Test

Period of the Study	M.	S. D.	T.	D.F	Sig.
Pre- Test	1.32	0.47	6.205	77	0.001
Post-Test	1.65	0.479			HS

M: Mean, SD Standard deviation, df: Degree of Freedom, Sig: Significance, , t: t-test

This table shows the results, which show At p. value= (0.001), there is a significant different between pre& post test.

## DISCUSSION

This is part of the study explain the study support for our results. The finding of the study indicate their ages were (41- more than) years old within age group, teachers were females in relation to gender. In terms of educational attainment, approximately half of the teachers in the study sample have achieved an Institute diploma. Regarding the address, most of teachers setting or lives in the urban. The majority of instructors were married when it related to marital status.. Regarding employee status, most of teachers were permanent employee. According to the findings of the study, The teachers had (at least) 21 years of experience as a teacher. and had not had the opportunity to participate in communicable disease control training sessions.

These result are agreement with<sup>(6)</sup> who found in their study that (78 %) There were a lot of female participants, (39%) of them are between the ages of 30 and 39 yrs old(65%) of them have been married, whereas (21%) remained single, and (50%) of them are graduates of the institute. In addition, According to the research, 26% of teachers have 15–19 years of experience in the field of education, and (58%) of the people in the sample had never attended a communicable disease control training session.



Also, other study is unconcerned with our study<sup>(7)</sup> that Emphasize and focus on putting teachers through training courses to increase their knowledge, abilities, and attention in order to keep them up to speed on communicable disease control. So, the teachers haven't knowledge and awareness about immunity and immunization related to control on communicable disease. The study finding that the indicate the different between pre and post-test for overall evaluation is fail for pre-test and pass for post-test.

These findings are concerned with<sup>(8)</sup> who found The study's findings revealed that the majority of the samples (37.8%) were between the ages of 41 and 50. The study also revealed that after the influence of the educational program, The teachers answered all of the questions (100%), with the largest percentage (35.6%) of the sample spanning from 1 to 10 years of experience.

This result is reinforced by<sup>(9);(10)</sup> they show that teachers' understanding was low prior to the implementation of an instructional program for primary school teachers and found improvement after provide information among teachers about immunity and immunization.

Other study that support for our result of study by<sup>(14)</sup>. Adult vaccination interventions are ineffective<sup>(15)</sup>, no existing interventions can effectively address vaccine hesitation<sup>(16)</sup> and<sup>(17)</sup> could not found evidence to advocate any kind of educational intervention to encourage people to get the HPV vaccine. On the other hand, a remark on the latter study highlights a research of a positive impact on attitudes and intentions about HPV vaccination in young Hungarian teenagers.

The result depict that indicate there is a significant difference between pre-test and post-test at p. value= (0.001)

This finding is agree with<sup>(11)</sup> who researches influence interventions in education of teenage vaccination knowledge with their attitudes, that found vaccination knowledge among teachers science by t. Test is" (p = 0.004, df-8). Who found statistical significant different between the simulated interventional and control groups, according to the analysis.

Others studies are related to our study but found through their study, that between the two groups, there was no statistically significant difference in involvement between the presentation-based intervention group and the digital-based resource group. This is significant given the current debate over the efficacy of so-called " Game For Health "<sup>(12, 13.)</sup>

## CONCLUSION

Through our study result can conclude:

1. Most of the study sample were age 41 years old and female and have level of education is institute and live in urban area.
2. The study sample have little knowledge about immunity and immunization, so all the teacher science need to education program to elevate of awareness about immunization and immunity for communicable disease.
3. There is difference between before and after education program among science teachers.

## RECOMMENDATIONS

1. The study suggests that the Ministries of Health and Education work together to develop a standardized book for primary schools about controlling and preventing communicable diseases via immunization and immunity. Increase chance for science teacher to enrolled teachers in all primary schools would receive training on the prevention of communicable diseases.
2. Encourage health sectors (school health unit) to follow up with science teachers on job education programs related to immunity and immunization.

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