

# Effect of Health Instructional Guidelines for Mothers about Their Children Vaccination

Sahar Mahmoud S. El Awady<sup>1\*</sup>, Azza El-Sayed Ali Hegazy<sup>2</sup>, Taghreed Talaat<sup>3</sup>

<sup>1</sup>Lecturer of Community Health Nursing, Faculty of Nursing, Helwan University

<sup>2</sup>Lecturer of Pediatric Nursing, Faculty of Nursing, El-Fayoum University

<sup>3</sup>Assistant Prof. of Medical Surgical Nursing, Faculty of Nursing, Helwan University, Egypt

\*Corresponding author: sayedmoustafa81@gmail.com

Received September 15, 2018; Revised October 20, 2018; Accepted October 28, 2018

**Abstract Background:** Vaccination means giving a vaccine to a child for activating immune system to resistant an infectious disease, by administration of a vaccine. These vaccines help to stimulate the body's own immune system to protect the children against subsequent diseases. **Aim** of this study is to evaluate the effect of instructional guidelines for mothers about children vaccination. **Design:** Quasi-experimental research design was used. **Sample:** purposive sample equal 375 mothers who having children and attending the routine immunization in MCH centers. **Settings:** study was conducted at two Maternal-Child Health Centers (in-Helwan and Ezbat Elwalda) at, Ain-Helwan District and Helwan City, Cairo, Egypt. **Tool:** one tool used; Interview questionnaire sheet composed of 3 parts (Socio-demographic characteristics, mothers' knowledge & mothers' reported practice regarding children vaccination). **Results:** the mean age of mothers was  $29.5 \pm 7.1$  years. Mothers' total knowledge was improved post instructional guidelines than pre. Also, satisfactory reported practices of mothers regarding vaccination was 75% at the post than pre the instructional guidelines. **Conclusion:** the study denoted that there was an improvement of mothers' knowledge and reported practice after applying the instructional guidelines than before with statistically significant differences. **Recommendations:** provide mothers by health instructional guideline and vaccination booklets which include the importance of vaccination, side effects and how to manage its complications, obligatory vaccine schedule and non-obligatory vaccine schedule in MCH centers.

**Keywords:** vaccination, instructional guidelines, Maternal-Child Health Centers (MCH)

**Cite This Article:** Sahar Mahmoud S. El Awady, Azza El-Sayed Ali Hegazy, and Taghreed Talaat, "Effect of Health Instructional Guidelines for Mothers about Their Children Vaccination." *American Journal of Nursing Research*, vol. 6, no. 6 (2018): 658-667. doi: 10.12691/ajnr-6-6-37.

## 1. Introduction

The immunity defined as an inherited or acquired state in which an individual is resistant to the occurrence or the effects of a specific disease, particularly an infectious agent. The World Health Organization defined immunization as the process whereby a child is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Types of immunity are natural and artificial. Vaccines are weapons to prevent diseases. This may be made of microorganisms similar to the ones that cause diseases, or of the toxins produced by the disease but changed so that they cannot harm people. Vaccination means giving a vaccine to child for activating immune system to resistant an infectious disease; it is widely identified as one of the most important public health advances [1]

Immunizations are often widely stated as less risky and an easier way to become immune to a particular disease than risking a milder form of the disease itself. Vaccination not only protects children against deadly

diseases but also assists in developing children's immune systems. Immunization helps prevent infectious diseases and saves live. It is responsible for the control of many infectious diseases that were once common in this country, as polio, measles, diphtheria and pertussis [2].

Vaccination side-effects involved fever, redness or swelling, pain, soreness, tenderness, cough, aches, headache and itching. If these problems occur, they usually begin soon after the shot. The mothers play a major role in promoting the health of children. Several misconception and inadequacy of knowledge in relation to vaccination are prevalent among mother especially under five years children increasing health, knowledge about diseases, and their prevention or management have successfully enhanced many different health outcomes in high income countries, especially among less literate populations [3].

World Health Organization (WHO, 2016) reported that 115 million children worldwide received Diphtheria-Tetanus and Pertussis vaccine, there is about 85% of the world's children taken one dose of measles vaccine, and obtained polio vaccine, however, remain the polio-endemic in two countries (Afghanistan & Pakistan) [3].

Immunization prevents an estimated two to three million deaths each year from Diphtheria, Tetanus, Pertussis (whooping cough), and measles. In Egypt, the estimated coverage rates of BCG (Bacilli, Chalmette, and Guerin), DPT (three doses of Diphtheria, Pertussis [whooping cough] and Tetanus), Hepatitis B (three doses of vaccine), Measles vaccines, Polio (three doses of the Polio vaccine), Rubella, and Tetanus Toxoid (two dose of vaccine) were ranged from 96- 98% for children aged 18 months [4].

Health instructional guidelines about vaccination can help in decrease parents misunderstandings and myths against immunizations and consequently increase the rates of immunizations. A health instructional guideline provides parents with importance, benefits of immunization and contributes to their decision to immunize their children. Community health nurses and pediatric nurses are an essential component in meeting the recommended immunizations goals. Nurses play an important role as educators, advocate, care provider, change agent and coordinator of care in immunizations program. The role of community health nurses and pediatric nurses should understand the concept of risk communication, as it is a vital tool in helping to discuss immunizations with, colleagues, family and communities. Being able to communicate about risk of non-vaccinated and important of many vaccine-preventable diseases like polio and diphtheria [5].

### 1.1. Significance of the Study:

According to world health organization total number of children less than five years in the world 2.2 billion child from total world population, 7.29 billion persons around the world. According UNICEF, 2017, Egypt's constituted 13.07 million children under five years from total population 96.37 million person. However, about 3 million children died in the developing countries so immunization is one of the most successful and cost effective public health interventions in the constant effort of human beings against diseases that affect our wellbeing. **Children Vaccination** has prevented more deaths in the past years than any other health interventions globally. Mortality rate may be greater in developing countries, because of low resistance of these children to infection. In the developing world about 23% of deaths among children under five years occur in the first month. In Egypt under-five mortality rate are 48/1000 live births, so in Egyptian MCH centers nurses proved a key role in administration of vaccines [6].

### 1.2. Aim of the Study:

This study aimed to evaluate the effect of instructional guidelines for mothers about their children vaccination through the following objectives:

- Assessment of mothers' knowledge and practice about vaccination.
- Designing and implementing the instructional guidelines according mothers' needs.
- Evaluating the effect of instructional guidelines about vaccination on mothers.

### 1.3. Research Hypotheses

**H1:** The mothers' knowledge will improve after

applying the instructional guidelines about vaccination.

**H2:** The mothers' reported practices will improve after applying the instructional guidelines about vaccination.

**H3:** There will be significant relations between knowledge and practices of mothers and their demographic characteristics.

## 2. Subjects and Method

### 2.1. Research Design

Quasi-experimental design was used to conduct this study.

### 2.2. Research Setting:

The present study was conducted at two Maternal-Child Health Centers (Ain-Helwan and Ezbat El-Walda) at Ain Helwan District, Helwan City, Cairo, Egypt.

### 2.3. Subjects:

Purposive sample includes 375 mothers were collected through six months for this study according to the inclusion criteria. Mothers who are having children with age two or four months, and go to the selected centers for their children take the routine immunization.

### 2.4. Sample Size:

Total number of children vaccinated in last year from beginning of January 2016 to end of December 2016 were 12048 child in the Child Health Centers (MCH) at the previously mentioned settings, according to sample size calculation at 95% confidence and present of error 5%, so sample taken equal 375 mothers for this study.

**Tools of data collection:** one tool used;

Structural interview questionnaire developed by investigators after reviewing the national and international related literature. It composed of three parts:

**Part I:** it consists of four items:

- A. Concerning with mothers' socio-demographic characteristics consisted of 4 closed ended questions such as age, level of education, social status, occupation and 3 open ended questions such as family number, crowing index and monthly income.
- B. Concerning with fathers' demographic characteristics consisted of 3 closed end questions such as age, level of education and occupation.
- C. Concerning with child demographic characteristics consisted of 3 closed ended questions such as age, sex.
- D. Concerning with child past vaccination and medical history consisted of 4 closed ended questions such as B.C.G vaccine side effects, hepatitis B vaccine during the first 24 hours and side effects after vaccination and 2 open ended questions such as dealing with B.C.G vaccine and hepatitis B vaccine side effects.

**Part II:** Mothers' knowledge about vaccination; it consists of three items:

- A. Assessment of mothers' general knowledge related

to vaccination. It consisted of 12 closed ended questions regarding meaning of immunization, side effects of immunization, contraindications of immunization, allergic reactions, sources of information about immunization, how to deal with immunization side effects.

- B. Assessment of mothers' knowledge related to obligatory vaccination. It consisted of 18 closed ended questions regarding immunization schedule, knowledge about hepatitis B vaccine, diphtheria, tetanus and pertussis vaccine, poliomyelitis vaccine, measles, mumps, rubella and varicella vaccine.
- C. Knowledge of mothers' related to non-obligatory vaccination. It consisted of 10 closed ended questions regarding non-obligatory vaccination schedule, knowledge about Rota virus vaccine, pneumococcal and Haemophilus influenza type B vaccine, hepatitis A vaccine and meningitis vaccine.

**Part III:** Assessment of mothers' reported practices regarding children vaccination which includes: care before, after immunization and care after BCG vaccine.

Scoring System for knowledge about obligatory, non-obligatory vaccination and general knowledge about children vaccination: -

This answered as the following:

Correct = 2 point.

Incorrect = 1 point

The scores of the items were summed up and were converted into a percentage score. Knowledge classified into 3 categories:

- **Good** if score  $\geq 75\%$ .
- **Average** if score  $60 - < 75\%$ .
- **Poor** if score  $< 60\%$
- Scoring System for reported practices by mothers about children vaccination.

This answered as the following:

Done = 2 point.

Not done = 1 point

The total score of this part were 6 points and scored as the following:

- Satisfactory practice was  $\geq 60\%$ .
- Unsatisfactory practice was  $\leq 60\%$ .

## 2.5. Data Collection Procedures:

- **Study Period:** The actual fieldwork was carried out from the beginning of March 2017 to ending of September 2017 over a period of six months in the previously mentioned settings. The time spent to fill in the questionnaire was 20-30 minutes. The researchers visited the study settings two days/week (Wednesdays & Thursdays) from 10.00 a.m. to 2.00 p.m. The researchers implemented the guidelines by using questioners for mothers (pre/ post format).
- **Approval:** An official letter was addressed to the Director of mentioned settings. The researchers explained the purpose and benefits of the study. The director was informed about the study title, aim, time and date of data collection.
- **Ethical considerations:** Official approval was obtained from the Faculty of Nursing. Then send to the director of mentioned settings. The researchers

explained the purpose and benefits of this study to the studied sample who agreed to participate in the study. Oral consent was obtained before data collection. They were assured that all the collected data will be used for research purpose only. Participants' anonymity, confidentiality, privacy, safety and protection were secured.

## 2.5. Tool Development:

- **Validity:** Tools were tested for content validity by a jury of 5 experts in the Community Health Nursing and Pediatric Health Nursing field to confirm the consequence and comprehensiveness of the tools.
- **Reliability:** Reliability coefficients were calculated for the questionnaires of: mothers' knowledge about vaccination, Cronbach's Alpha was 0.91. While reported practices of mothers' about vaccination, Cronbach's Alpha was 0.87.
- **Pilot study:** A pilot study was carried out on 10% of the study sample equal 38 mothers' to evaluate tools for clarity, applicability and to estimate the time required for filling in the tools before starting the actual data collection. Data obtained from the pilot study were analyzed and the necessary modifications and rearrangements on the study tools were done. Participants in the pilot study were excluded from the main study sample.

### Construction of guidelines for mothers about children vaccination includes the following:

- At the beginning of the interview, the researchers greeted the mothers', introduced themselves to each one included in the study. This phase covered interviewing the studied sample to collect baseline data. The pretest questionnaire was implemented to identify the mothers' knowledge and reported practices about vaccination.
- A health instructional guideline for mothers was developed based on the findings of the assessment and in the light of related literatures. The knowledge regarding vaccination included meaning, types, common symptoms, signs, side effect and contraindications were prepared. Practices about vaccination before, during and after were designed to improve mothers' practices regarding vaccination.
- The researchers implemented the guidelines followed by the immediate post-test, which lasted over a period of 6 months; by giving 3 sessions for theoretical knowledge and 2 sessions about practices of vaccination to each mothers.
- Different teaching methods were used including videos, pictures and designed booklet. In addition, more contact between researchers and all studied mothers' to exchange questions, experiences between groups and to determine the effect of it on mothers' knowledge and practices.

**The booklet included:** Meaning of vaccination, types, obligatory and non-obligatory vaccination, side effects, contraindications and care of the child after vaccination.

Evaluating of guidelines was done immediately after its implementation by using the same preprogramming tools.

## 2.6. Statistical Analysis:

Data entry and analysis were done using the Statistical Package for the Social Sciences (SPSS), version 23 and state graphics statistical software packages. Data were presented using descriptive statistics in the form of frequencies and percentages. Quantitative data were presented in the form of mean  $\pm$  SD. Qualitative variables were compared using Chi-Square test ( $X^2$ ) to compare between 2 qualitative variables. Statistical significance was considered at P-value $<0.05$

## 3. Results

**Table 1:** Shows that, the mean age of mothers was  $29.5 \pm 7.1$  years. Also, 7.6% of the mothers were divorced. Moreover, 37% & 58% of mothers had secondary education and their jobs were housewife, respectively. Additionally, 65.1% & 55% of mothers are living in Urban and their crowding index was 4-5 respectively and 49.1% of the mothers had unsafe and not efficient of essential need monthly income.

**Table 2:** Reveals that, 77.8%, 79%, 26.6% & 29.5% of the mothers had poor knowledge regarding meaning, importance, types and side effects of immunization respectively. Additionally, 83.7% of the child vaccination in campaigns which significant changed post instructional guidelines to 85.8%. This table shows a highly statistically significant improvements in mothers' knowledge about immunizations post implementation of instructional guidelines than per-guidelines where P value = 0.00 in all items.

**Table 3:** Shows that, 74.6% of the mothers' had poor knowledge about non-obligatory immunization before instructional guidelines which improved after the guidelines. Also, there was a highly statistically significant improvements in mothers' knowledge about non-obligatory immunization post implementation of instructional guidelines where P= 0.00.

**Table 4:** Reveals that, there was improvement in mothers' total knowledge regarding immunizations after applying the guidelines, which pretest was 17.7% of mothers had good knowledge while it was 74% post implementation of instructional guidelines where P= 0.00.

**Figure 1:** Shows that, there was a marked improvement in mothers' total practices about vaccination after implementation of instructional guidelines with highly statistically significant differences where P value = 0.00 between pre - and post-test after implementation of instructional guidelines.

**Table 5:** Shows that, there was a highly statistically significant relations between mothers' total knowledge about vaccination post- instructional guidelines with marital status and place of residence where P value = 0.00. Moreover, there was a statistically significant relations between mothers' total knowledge about immunizations post- guidelines with their age and educational level where p value = 0.03, 0.02 respectively. While, there was statistically insignificant relations between mothers' total knowledge about vaccination post guidelines with job where p value = 0.07.

**Table 6:** Displays that, there was a highly statistically significant relations between mothers' total practices about vaccination with residence and educational level where P value  $<0.01$ . Also, there was a statistically significant relations between mothers' total practices about vaccination with their age, crowding index, occupation and monthly income at p. value  $<0.05$ . While, there were statistically insignificant relations between mothers' total practices about vaccination and marital status at P- value  $>0.05$ .

**Table 7:** Presents that there were positive correlations between mothers' total knowledge regarding vaccination and their total practices. Moreover, there was a highly significance improvement in mothers' total knowledge and total practices.

**Table 1. Frequency Distribution of mothers' Socio-Demographic Characteristics (N=338).**

Variables	No	%
<b>Age</b>		
< 20	96	28.4
20-<30	168	49.7
30- 50	74	21.9
<b>Mean <math>\pm</math> SD = 29.5<math>\pm</math>7.1</b>		
<b>Marital Status</b>		
Divorced	26	7.6
Widow	52	15.4
Married	240	71
<b>Consanguinity mother with husband</b>		
Yes	102	30.2
No	236	69.8
<b>Mothers' education</b>		
Illiterate	56	16.5
Read and write	108	32
Secondary education	125	37
University	49	14.5
<b>Mothers' job</b>		
Housewife	196	58
Employee	78	23.1
Student	64	18.9
<b>Residence</b>		
Urban	220	65.1
Rural	118	34.9
<b>Crowding index</b>		
1-3	62	18.3
4-5	186	55
>5	90	26.7
<b>Monthly income</b>		
Enough and save	60	17.8
Enough and not efficient of essential need	112	33.1
Not enough and not efficient of essential need	166	49.1

**Table 2. Frequency Distributions of the Mothers' Knowledge about General Vaccination Pre & Post Instructional Guidelines (N=338).**

Variables	Pre Instructional Guidelines				Post Instructional Guidelines				x <sup>2</sup>	P
	Correct		Incorrect		Correct		Incorrect			
	No	%	No	%	No	%	No	%		
Meaning of vaccination	75	22.2	263	77.8	317	93.8	21	6.2	7.38	.000**
Importance of vaccination	71	21	267	79	305	90.2	33	9.8	6.34	.002**
Effect of vaccines on child immunity	58	17.2	280	82.8	297	87.9	41	12.1	10.59	.001**
<b>Child type of immunity:</b>										
- Natural immunity	50	14.7	90	26.6	87	25.7	20	6	5.65	.000**
- Acquired immunity	20	5.9	84	24.8	100	29.6	15	4.4		
- Both together	16	4.7	78	23	116	34.3	0	0.0		
Importance breast feeding	105	31.1	233	68.9	295	87.3	43	12.7	8.94	.004**
<b>Vaccination Side effects:</b>										
- Fever	100	29.5	30	8.9	143	42.3	0	0.0	11.38	.000**
- Redness	75	22.2	5	1.5	81	24	0	0.0		
- Tenderness	90	26.6	7	2.1	98	29	0	0.0		
- loss of appetite	25	7.4	6	1.8	16	4.7	0	0.0		
Child immunization allergy	66	19.5	272	80.5	285	84.3	53	15.7	8.24	.003**
<b>Contraindications of immunization:</b>										
Severe allergic event to vaccines	10	2.9	81	23.9	90	26.6	14	4.1	10.28	.001**
Cancer patient.	15	4.4	55	16.2	60	17.7	10	2.9		
Acute febrile illness	10	2.9	60	17.7	30	8.8	5	1.5		
Fits	22	6.5	85	25.1	114	33.7	7	2		
<b>Sources of information:</b>										
- MCH nurses	55	16.2	100	29.5	150	44.3	20	5.9	10.87	.000**
- Relative	60	17.7	33	9.7	50	14.7	15	4.4		
- Social media	30	8.8	25	7.3	23	6.8	15	4.4		
- T.V	10	2.9	25	7.3	50	14.7	5	1.4		
Mothers experience with immunization from another child	86	25.4	252	74.6	287	84.9	51	15.1	5.65	.000**
Child vaccination in campaigns less than week	55	16.3	283	83.7	290	85.8	48	14.2	10.65	.000**

**Table 3. Frequency Distributions of the Mothers' Knowledge about Non Obligatory Vaccination (N=338).**

Variables	Pre Instructional Guidelines				Post Instructional Guidelines				x <sup>2</sup>	P
	Correct		Incorrect		Correct		Incorrect			
	No	%	No	%	No	%	No	%		
<b>2 months vaccine</b>										
Pneumococcal and Rota virus vaccine	45	13.3	293	86.7	302	89.3	36	10.7	8.25	.000**
<b>4 month vaccine</b>										
Pneumococcal and Rota virus vaccine	58	17.2	280	82.8	297	87.9	41	12.1	7.36	.001**
<b>6 month vaccine</b>										
Pneumococcal and Rota virus vaccine	86	25.4	252	74.6	287	84.9	51	15.1	9.65	.002**
Haemophilus influenza type B vaccine	105	31.1	233	68.9	295	87.3	43	12.7	11.32	.005**
<b>12 months vaccine</b>										
Hepatitis A vaccine	75	22.2	263	77.8	317	93.8	21	6.2	10.32	.001**
Chicken box vaccine	58	17.2	280	82.8	297	87.9	41	12.1	11.67	.000**
<b>18 months vaccine</b>										
Chicken box vaccine	197	58.3	141	41.7	315	93.2	23	6.8	9.98	.000**
<b>24 months vaccine</b>										
Meningococcal vaccine	68	20.1	270	79.9	288	85.2	50	14.8	13.67	.000**
Active Hepatitis A vaccine	58	17.2	280	82.8	297	87.9	41	12.1	9.56	.001**
<b>4years vaccine</b>										
Active BCG a vaccine	155	45.9	183	54.1	283	83.7	55	16.3	10.35	.007**

**Table 4. Frequency Distribution of the Mothers' Total Knowledge about Vaccination Pre & Post Guidelines (N=338).**

Total knowledge about Immunizations	Pre instructional guidelines		Post instructional guidelines		x <sup>2</sup>	P. value
	No	%	No	%		
Good	60	17.7	250	74	50.15	.000**
Average	50	14.8	45	13.3		
Poor	228	67.4	43	12.7		

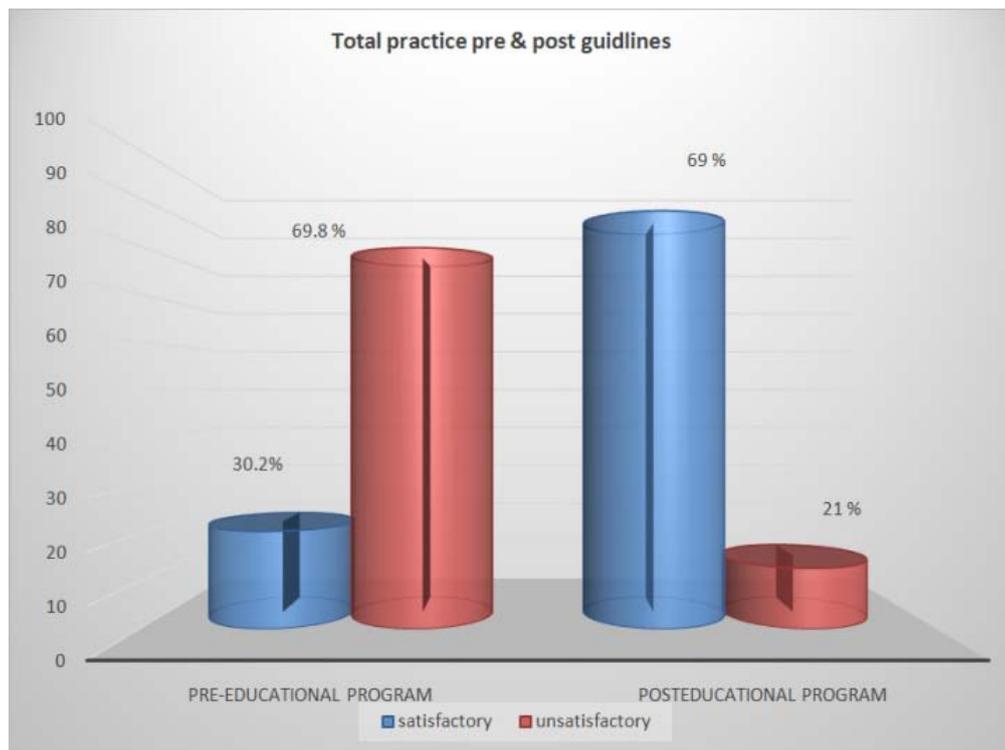


Figure 1. Frequency Distribution of the Mothers' Total Reported Practices Regarding Vaccination (N=338).

Table 5. Relation between mothers' Socio-Demographic Characteristics and their Total Knowledge Post Guidelines about Vaccination (N=338).

Demographic characteristics		Total knowledge after instructional al program						X <sup>2</sup>	P-value
		Good (N= 250)		Average (N= 45)		Poor (N= 43)			
		N	%	N	%	N	%		
Age	< 20 years	80	32	5	11.1	11	25.5	6.992	0.03*
	20-<30 years	124	49.6	30	66.6	14	32.5		
	30-40 years	46	18.4	10	22.2	18	41.8		
Marital Status	Divorced	52	20.8	8	17.7	3	7	1.872	.000**
	Widow	14	5.6	3	6.66	35	81.4		
	Married	184	73.6	34	75.5	5	11.6		
Mothers education	Illiterate	21	8.4	3	6.6	3	7	4.672	0.02*
	Read and write	90	38.4	8	17.7	5	1.16		
	Secondary	96	36	30	66.6	4	9.3		
	University	43	17.2	4	8.9	31	72		
Mothers' job	Housewife	171	68.4	10	22.2	8	18.6	5.227	0.07
	Employee	60	24	20	44.4	5	11.6		
	Student	19	7.6	15	33.3	30	69.7		
Residence	Urban	181	72.4	34	75.5	5	11.6	3.146	.000**
	Rural	69	27.6	11	24.4	38	88.3		

> 0.05 insignificant \*≤ 0.05 significant \*\*≤ 0.001 highly significant

**Table 6. Relation between Mothers' Socio-Demographic Characteristics and their Reported Practices about Vaccination Post Guidelines (N=338).**

Items		Total Practices post Guidelines					
		Unsatisfactory (N= 69)		Satisfactory (N= 224)		X <sup>2</sup>	P-Value
		N	%	N	%		
Age	<20 years	40	58	95	42.4	6.53	0.04*
	20-<30 years	19	27.5	99	44.2		
	30-40 years	10	14.4	30	13.4		
Marital Status	Married	22	31.8	45	20.1	3.942	0.139
	Divorced	41	59.4	123	54.9		
	Window	6	8.6	56	25		
Residence	Urban	60	86.9	189	84.3	7.85	.000**
	Rural	9	13.1	35	15.6		
Crowding index	1-3	43	62.3	132	59	1.16	0.04*
	4-5	16	23.1	22	9.8		
	>5	10	14.4	70	31.2		
Educational level	Illiterate	4	5.7	81	36.2	17.15	.000**
	Reading & writing	11	15.9	11	4.9		
	Secondary	26	37.6	125	55.8		
	University	28	40.5	8	3.5		
Mothers' job	Housewife	46	66.6	105	46.8	12.62	0.02*
	Employee	15	21.7	105	46.8		
	Student	8	11.5	14	6.2		
Income	Safe & save	38	55	24	10.7	13.92	0.03*
	Safe & not efficient	20	29	100	44.6		
	Un Safe & not efficient	11	16	100	44.6		

**Table 7. Correlations between Mothers' Total Knowledge and Total Practices Regarding Vaccination**

Items	Total knowledge	
	R	P value
Total practices	0.451	0.000**

## 4. Discussion

Vaccinations enhance stimulation the body's own immune system to protect the children against subsequent infection or disease. The children need to be protected from six infectious diseases as tuberculosis, tetanus, diphtheria, whooping cough and poliomyelitis. The under five children can be saved from deaths by immunizing them at the right age, right time by completing the full course of immunization. Purpose of immunization is artificially inducing active immunity so there will be resistance to the pathogen under laboratory condition from either dead or severely weakened antigen. Vaccines are administered to prevent various forms of disease when their vaccines are given then basically improve the immunity to the disease when an antigen is administered through immunization, the body recognize this as foreign and states producing antibodies to kill it and remember it so even if they encounter later they can destroy them [7].

Regarding to socio demographic characteristics of mothers, the current study revealed that the half of the mothers' ages were ranged between 20 - 30 years, and less than ten percent of them were divorced. This result agreement with **Khalil et al [8]** titled in "Uptake of Childhood Immunization among Mothers of Under Five in South Western Nigeria", who found that mean age of mothers was 34.1±2 and 66 % of them were divorced.

Concerning with level of education, occupation, consanguinity of mothers with her husband and monthly

income, the current study revealed that more than half of the mothers were secondary school education and more than half of the mothers their job were housewife, and the majority of them had consanguinity with her husband and had an safe not efficient monthly income. This result disagrees with **Rachna & Sheetal [9]** whose study titled in "Awareness and knowledge of mothers of fewer than five children regarding immunization in East Delhi, Indian" they reported that 50% of the subjects were higher education, and employee, 60% of subjects had consanguinity with husband and 56% had safe and not efficient income. From the researchers' opinion this result may be due to ignorance and lack of interest in girls' education as they live in area which consider slum are.

Concerning mothers' knowledge about immunization, the present study showed that there was significant improvement in mothers' knowledge after implantation of health instructional guidelines regarding meaning, type of immunization and immune system, the findings of the present study revealed that the majority of the them had correct knowledge regarding meaning & types of immunization in post guidelines. Also the present study results revealed that more than half of mothers' sources of information about immunization were T.V, followed by nurses in the MCH centers. This results disagree with **Kaljee, [11]** in study titled "Determinants of Childhood Vaccination Coverage in Kazakhstan" who found that 75% of mothers had incorrect knowledge of the meaning and types of immunization and immunity system and

acquire their knowledge about immunization through relatives and internet, while this result agreement with the study conducted by **Adeyinka [12]** titled in "Nursing care of infants and children in India" who reported that 65.7 % of the respondents gain information about vaccine preventable diseases from antenatal clinics & role of media was only 4.8% mothers gain their information about time of vaccinations from street advertise then, from birth certification. Also, this results agree with **Mabrouka [10]** who study titled in "Knowledge, attitude and practices of women regarding vaccination of infants and preschool children at Al-Beida City, Liby", found that 85% of mothers had good knowledge about vaccination and 75% of them managed side effect of BCG vaccine after delivery. From the investigators opinion this result may be due to the mother will be exposed to the legal issue in case the child not vaccinate with full obligatory immunization schedule

As regarding to mothers' knowledge about side effects and contraindication of immunization, the present study showed that there was significant improvement in mother's knowledge after implantation of nursing instructional guidelines regarding side effects and contraindication of immunization, the finding of present study reported that more than half of the mothers' have correct knowledge about immunization side effects and contraindication in post program. This finding is congruence with **Bofarraj [13]** who study titled in "Immunization coverage, knowledge and practices of mothers regarding immunization in rural area in Indian" who found that side-effects and contraindication of immunization as thought by the mothers were fever (8.2%), deformity (55%), tenderness (2.4%), and diarrhea (2.2%). From the investigators opinion this result due to mothers wasn't received health instructional guidelines and training program regarding child vaccination. Also low educational level of mothers and poor living condition.

Regarding, mothers' knowledge about child vaccination in campaigns, the present study showed that there was significant improvement in mothers' knowledge after implantation of guidelines. Regarding child vaccination in campaigns the present study revealed that more than half of the mothers' had correct knowledge about child vaccination in campaigns post guidelines. The results agreement with **Hamid [14]** who study titled in "Immunization of Children in a Rural Area in China", that found 69% of mothers had good knowledge regarding immunization which illustrated good knowledge, good practices of the studied mothers regarding child vaccination in campaigns.

Concerning with mothers' knowledge about obligatory vaccination, the present study showed that there was significant improvement in mothers' knowledge after implantation of nursing instructional guidelines regarding obligatory vaccination, the current study finding that more than half of study sample were know about the following diseases (T.B, Measles and Hepatitis B, poliomyelitis,) followed by don't know in pre-program. This result disagreement with the result of study performed by **Roos & Bernsen [15]** who study titled in "Knowledge, attitude and practices of mothers towards vaccination in a Traditional City in the United Arab Emirates", they found maximum number of respondents (85%) have knowledge about

poliomyelitis, while measles & tuberculosis was known to 40% & 35 % of respondents. Furthermore, the results agree with **Sharma & Bhasin [16]** who study titled in "Factors associated with immunization coverage of children in Assam, India" they found 5 maximum numbers of respondents (61%) knew about measles and tuberculosis (52.5%). Knowledge about Hepatitis B was very low. From the researchers opinion this result may be due to low literacy level of mothers so mothers don't know about the diseases for which their child is being immunized.

Concerning mothers' knowledge about non-obligatory vaccination, the present study showed that there was a significant improvements in mothers' knowledge after implantation of health instructional guidelines regarding non obligatory vaccination, the present results revealed that the majority of studies sample have correct knowledge regarding children vaccination against pneumococcal and Rota virus, active BCG at 4 years, Hepatitis A, meningococcal, chicken box and less than half of children vaccinate with influenza in post program. These results were disagreement with **Singleton [17]**. who study titled in "Impact of immunizations on the disease burden of American Indian and Alaska native children" he found similar high prevalence (89%) from children not vaccinate with hepatitis A.

On the other hand, the results disagree with the study done by **Glass & Parashar [18]** who study titled in "Rotavirus and acute diarrheal disease in children in Alexandria, Egypt" they found that (65%) of caregivers relatively unknown about rotavirus vaccine. From the investigators opinion this result may be due to absent antenatal clinics role & role of media in health awareness about importance and timing of non-obligatory vaccinations through street advertise about non obligatory vaccination.

Concerning with mothers' knowledge about meningococcal, chicken box vaccine, the present study showed that there was significant improvement in mothers' knowledge after implantation of health instructional guidelines regarding meningococcal, chicken box vaccine; the present study revealed that the majority of studies have correct knowledge regarding children vaccination against meningococcal, chicken box in post guidelines. This result was in agreement with the result of study performed by **Stefanelli & Rezza [19]** titled in "Impact of vaccination on meningococcal epidemiology in Italy" who found that 64.1% of parents had a positive attitude toward vaccinating their children with the meningococcal, chicken box vaccine. From the investigators opinion this result may due to low monthly income of the studies samples so they cannot afford for non-obligatory vaccination as it not available for free at the Maternal- Child Health centers.

This result answered the research hypotheses "H1: The mothers' knowledge will improve after applying the instructional guidelines about vaccination".

Regarding to mothers' reported practice toward care before & after vaccination, the present study showed that there was significant improvement in mothers' practice in post guidelines than pre instructional guidelines, the current study finding that more than half of mothers' had satisfactory practices toward care before & after vaccination in post guidelines. This results disagree with **Frazier & Bankole [20]** in study titled "Vaccination

resistance, religion and attitudes to science in Nigeria" they found that 56% of the studies subject had inadequate practices in dealing with child before and after vaccination but 65% had adequate practices in the post test. From the investigators opinion the positive performance may be due to mothers were recognize the importance nursing care pre & after child immunization.

As regarding to relation between mothers' reported practices and their socio-demographic characteristics. The present study revealed that there was highly statistically significant relation between mothers' total practice about immunization with residence and educational level P value <0.01. These results were agreed with **Shah [22]** in study title "practice of immunization in an urban educated population, Indian", who explain that there was a significant relation between studies sample total practice with residence and educational level.

This result supported the research hypotheses" H2: The mothers' reported practice will improve after applying the instructional guidelines about vaccination" The mothers' practice will increase after applying the instructional guidelines."

As regarding to relation between mothers' total knowledge and their socio demographic data, the present study revealed that there was highly statistically significant relation between mothers' total knowledge about immunizations post- instructional guidelines and marital status and place residence P value 0.00. Moreover, there was statistically significant relation between mothers' total knowledge about immunizations post- instructional guidelines and their age, at p value 0.03, 0.02. These result were agreement with **Ahmed [21]** in study title " Mothers' awareness and knowledge of under five years' children regarding immunization in Minia city Egypt", who found that was statistically significant relation between mothers' total knowledge, marital status, place residence, their age and educational level p value 0.03, 0.01.

Additionally, the present study revealed that there was statistically insignificant relation between mothers' total knowledge about vaccination post- instructional guidelines and job p. value 0.07. This finding is agreeing with found by **Ahmed [21]** who found that there was statistically insignificant relation between total knowledge of mothers about vaccination with their job p. value 0.06.

According to the present study there was a statistically significant relation between mothers' total practices about vaccination with their age, crowding index, occupation and monthly income p.value <0.05. While, there no statistically insignificant relation between mothers' total practices about immunization and marital status p. value >0.05. These results were in agreement with **Quaiyum [23]** in study title "Impact of national Immunization days on polio-related knowledge and practices of Urban mothers' in Bangladesh", who reported that statistically insignificant improvement in the total mean scores of practice of the study group regarding immunization from pre-guidelines to post guidelines.

This result answered the research hypotheses" **H3:** There will be a significant relation between knowledge and practices of mothers and their demographic characteristics".

Regarding correlations between mothers' knowledge and practices regarding immunization, the present study revealed that there was a positive correlation between

mothers' total knowledge and their total practices about immunization. Moreover, there was a highly significant improvement in mothers' total knowledge and total practices at post- test. These results were in agreement with **Quaiyum [23]** who reported that statistically significant improvements in the total mean scores of practices of the study group regarding immunization from pre-program to post program. From the researchers point of view this result may be due to increase mothers' awareness and modified their practices with the children about vaccination

## 5. Conclusion

There was a marked improvement in mothers' knowledge about obligatory, non-obligatory and general knowledge about vaccination after applying the instructional guidelines, than before with statistical significant differences. Additionally, there was an improvement in mothers' total reported practices scores regarding care before, after vaccination after applying the guidelines, than before with statistical significant differences.

## 6. Recommendations

Based on the findings of the present study the researchers recommend that:

Provide mothers' by health instructional guidelines and vaccination booklets which include the importance of vaccination, side effects and how to manage it, obligatory and non-obligatory schedules in MCH centers.

Encourage vaccination sessions for mothers' with children less than one year as well as social group meetings between mothers with children in the same age to exchange information at maternal and child health centers under observation from community health and pediatric nurses.

## References

- [1] Haneef, SM., Maqbool, S., Arif, MA. (2014): Immunization general considerations. Textbook of pediatrics, 1st ed. Pakistan Pediatric Association, International Book Bank, pp. 341.
- [2] Usman, HR., Akhtar, S., Habib, F., Jehan, I. (2016). Redesigning immunization card and Center based instructional to reduce childhood immunization dropouts in urban Pakistan: a randomized controlled trial. *Vaccine*, pp. 467-472.
- [3] Hong, R., Banta, JE. (2015). Effects of extra immunization efforts on routine immunization
- [4] Wong's, DL. (2015). Nursing care of infants and children (7th edition). India: Elsevier publishers.
- [5] Al-Lela OQ, Bahari MB, Salih MR, Al-Abbassi MG, Elkalmi RM, Jamsheer SQ: Factors underlying inadequate parents' awareness regarding pediatrics immunization: findings of cross-sectional study in Mosul-Iraq. *BMC Pediatr* 2014, 14(1): 29.
- [6] Expanded program on Immunization. UNICEF program in South and Center of Iraq. UNICEF response to prevent child deaths, diseases and disabilities from the six preventable disease June 2015 last update. [Cited 2002 July 24]. Available from: URL: <http://www.pdh.sdnpc.org/expand-progimmunization.html>.
- [7] Jose J, Roshni M & Nisha K., et al (2013): Awareness on immunization among mothers of under-five children, international journal of innovative research & development, 2 (6): 621. *Journal of Health Research*, 3, (1); 8-12.
- [8] Khalil, I, Troeger, C., Awosika, Bahari MB., Al-Qazaz HK., Salih,

- MR., Jamshed, SQ., Elkalmi, RM. (2015). Are parents' knowledge and practice regarding immunization related to pediatrics' immunization compliance? a mixed method study. *BMC Pediatr.*
- [9] Rachna Kapoor, and Sheetal Vyas. (2013): Awareness and knowledge of mothers of under five children regarding immunization in Life Science Journal 10(4) <http://www.lifesciencesite.com> 1232 Ahmedabad. Healthline Journal, Jule Desember (1); 12-15.
- [10] Mabrouka, A.M., (2015). Knowledge, attitude and practices of mothers regarding immunization of infants and preschool children at Al-Beida City, Libya, Egypt *J Pediatr Allergy Immunol*; pp.29-34.
- [11] Kaljee, L., Pach, A., Garrett, D., Bajracharya, D., Karki, K., & Khan, I. (2017): Determinants of Childhood Vaccination Coverage in Kazakhstan a qualitative study. *The Journal of infectious diseases*, pp.243-249.
- [12] Adeyinka, D. (2016). Nursing care of infants and children in India. *The Internet Journal of Epidemiology*, 7; Number 2; pp.54-66
- [13] Bofarraj, Awasthi, S., Nath, B., Singh, Bhushan V., Kumar, V., Singh, SK.. (2018): Study on Immunization coverage and knowledge and practices of mothers regarding immunization in rural area in Indian a 30 Cluster Survey. *OJHAS* 7(1): 2-10.
- [14] Hamid, Q., Zeng, H., Chen, B. (2013). "Immunization of Children in a Rural Area in China" *BMC Public Health* pp.203.
- [15] Roos, M., Bernsen, Fatmah, R., Al-Zahmi, Noura, A., Al-Ali, Rowayah O., Hamoudi, Noura A. Ali, John Schneider, Jamal Al-Mutawa. (2016). Knowledge, Attitude and Practice towards Immunizations among Mothers in a Traditional City in the United Arab Emirates. *Journal of Medical Sciences*, pp. 114- 121.
- [16] Sharma & Bhasin. (2014). "Factors associated with immunization coverage of children in Assam, India" pp. 83-103.
- [17] Singleton. (2014). Impact of immunizations on the disease burden of American Indian and Alaska native children" Publishers, India, pp.249-250.
- [18] Glass, R., Parashar, UD, Bresee, JS, J G., Turcios, R., JB. (2014): Rotavirus and acute diarrheal disease in children in Alexandria. Egypt., Washington DC. Pan American Health Organization, 111-119. Scientific and Technical Publication 593
- [19] Stefanelli, P., Rezza, G. (2015). Impact of vaccination on meningococcal epidemiology in Italy. *Hum Vaccine Immunotherapy*.
- [20] Frazier & Bankole, A. (2014). Vaccination resistance, religion and attitudes to science in Nigeria published thesis, p. 50.
- [21] Ahmed, S.M., Abd-El Rahman, T.A., & Masoed, E.S (2013): Mothers' awareness and knowledge of under-five years' children regarding immunization in Minia City Egypt, *Life Science Journal*; 10: 4.
- [22] Shah B, Bresee JS, J G, Turcios R. (2013). "practice of immunization in an urban educated population, Indian", pp. 28
- [23] Quaiyum MA, Tunon C, Hel Baqui A, Quaiyum Z, Khatun J. (2015). Impact of national Immunization days on polio-related knowledge and practice of urban mothers' in Bangladesh, *Health Policy Plan*; pp. 363-71.