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Knowledge, Attitude and Practice of Mothers toward Children's Obligatory Vaccination

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Abstract
Background: *Vaccine preventable diseases (VPD) are considered one of the main causes of sicknesses and deaths among children all over the world, parents' knowledge and attitude towards immunization are likely influence uptake, vaccination is one of the most cost-effective public health tools to prevent infectious diseases.*
Objective: This study aimed to assess knowledge, attitude and practice of mothers' toward children's obligatory vaccination
Design: *Cross-sectional survey was utilized; the study was conducted through mother's home visits at Damietta Governorate. The sampling method used was the cluster sampling approach promoted by the World Health Organization, Total number of the cluster was 30 clusters and 7 mothers from each cluster. The first house visited in each cluster was selected randomly according to availability of household list. Total number of mothers sample was 210 from 5 districts (1050 mothers). Four structured interviewing sheets were used to assess socio-demographic data, knowledge, attitude and practice of mothers toward obligatory vaccination. The data were analyzed using SPSS (Stand for statistical product and service solutions) version 16.*
Results: *revealed that there was a positive statistically significant correlation between knowledge and practice of the studied mothers.*
Conclusion*: less than half of the studied mothers had poor knowledge score while less than one third had good score, more than two thirds of the studied mothers had good attitude score while the minority had poor attitude score, and more than one third of mothers had good practice while one quarter had poor practice*
Keywords: *Attitude, Obligatory vaccination, Knowledge, Mothers, Parents, Practice,*

What is already known about the topic?

- Vaccination is often cited as one of the most achievement of public health and the most cost effective intervention for child health promotion. However, this success has always been challenged by individuals and group factors.

What this paper adds?

- This paper provides insight about mothers' knowledge, attitude and practice scores toward their children's obligatory vaccination in Damietta Governorate.

I. Introduction

Immunization which has greatly reduced the burden of infectious diseases prevents illness, disability and death from vaccine preventable diseases including, Measles, Pertussis, Diphtheria, Polio, Rubella and Tetanus1 Immunizing a child significantly reduces costs of treating diseases, thus providing a healthy childhood and reducing poverty and suffering2.

World Health Organization (WHO, 2016) reported that 115 million infants worldwide received Diphtheria-Tetanus and Pertussis vaccine, there is about 85% of the world's children received one dose of measles vaccine, and received polio vaccine, however, remain the polio-endemic in two countries 3 (Afghanistan & Pakistan). Immunization prevents an estimated two to three million deaths each year from Diphtheria, Tetanus, Pertussis (whooping cough), and Measles 4 According to the Unicef, (2014) 5. In Egypt, the estimated coverage rates of BCG (Bacilli Chalmette-Guerin, DPT3 (three doses of Diphtheria, Pertussis (whooping cough) and Tetanus, HepB3 (three doses of Hepatitis B vaccine), Measles vaccines, Pol3 (three doses of the Polio vaccine), Rubella, TT2 (two dose or more of Tetanus Toxoid vaccine) was ranged from 96-98% for children aged 18-29 months Immunity can be divided into active and passive immunity. Naturally acquired active immunity occurs when the person is exposed to a live pathogen, develops the disease 6; artificially acquired active immunity can be induced by a vaccine, a substance that contains the antigen 7 Artificially acquired passive immunity is a short-term immunization by the injection of antibodies, such as gamma globulin, that are not produced by the recipient's cells. Naturally, acquired passive immunity occurs during pregnancy; in which certain antibodies are passed from the maternal into the fetal 8.

The attitude of most mothers towards immunization services is positive and relies on the efficacy of the vaccine to protect against disease; there was a poor attitude towards polio immunization among respondents who believe that it contains anti-fertility agents. Decision-making on immunization of a child lies predominantly on the father; and, if vaccination was rejected because of rumors and the priority accorded to parent's preference to more severe diseases 9.

Mothers' knowledge, attitude and practice play an important role in achieving complete immunization before first birthday of the child, the previous parent factors are also contributing to success or failure of immunization program 10, knowledge attitude, and practice studies provide information about the people awareness of certain topics, their feelings and their practices 11.

II. Aim of the study

This study aimed to assess knowledge, attitude and practice of mothers toward children's obligatory vaccination.

III. Subjects and Methods

The study was conducted by mother's home visits at Damietta governorate. The sampling method used was cluster sampling approach promoted by the WHO, Total number of the cluster was 30 clusters and 7 mothers from each cluster. The first house visited in each cluster was selected randomly according to availability of household list. Total number of mothers sample was 210 from 5 districts (1050 mothers)

3.1 Study design:

A cross-sectional survey was utilized.

3.2. Study Setting:

The study was carried out at mother home in Damietta Governorate, Egypt, during the year 2015.

3.3 Subjects:

The researchers met and provided the potential participants with information about the study. Interviews were done to participated mothers in the study. Completed interview questionnaires by the researchers

3.4 Data collection

The survey interview questionnaires sought data relating to socio-demographic characteristics of mothers. The sheet includes age, education level, occupation, number of children. Knowledge levels toward children's obligatory vaccination include their source of knowledge about obligatory vaccination, types, benefits of vaccination and vaccination schedule. The respondents' knowledge was tested with 21 knowledge items which required true or false answers relating to diseases controlled by obligatory vaccination, importance contraindication and vaccination schedule with routes and doses. Correct answer scored= (1), while an incorrect answer scored = (0).The respondents were divided into fair, poor and good groups evaluated as follows: poor = less than 50% while from fair = 50-65% and Good = more than 65% Attitude likert scale of children's obligatory vaccination consists of 16 statements with 3 point-scale (agree), (uncertain) and (disagree). The main categories of the attitude scale include importance of obligatory vaccination for children and its safety, side effects of vaccination and its effectiveness in prevention of communicable disease. Each subject was instructed to choose one of the three possible responses for each statement. Scoring system: scoring was as; agree = 2, uncertain = 1and disagree = 0 for the positive attitudes; while agree = 0, uncertain = 1 and disagree = 2 for the negative attitudes. The total score of attitude ranged from 0-32. The attitude score was evaluated as; Poor = less than 50%, Fair = 50-65% and Good = more than 65%.

Practice tool was classified into 8 categories, composed of 13 questions. One mark was awarded for each correct answer, the total score of the practice ranged from 0 to 13. The practice score was evaluated as follows; Poor = less than50%, Fair= 50-65% score and Good = more than 65%.

3.5 Pilot study

A pilot study was conducted on (105) 10 % of the studied mothers who were selected randomly from the mentioned settings and were later excluded from the main study sample to evaluate the clarity, applicability, reliability and to estimate time needed to fill in the research tools. On the basis of collected information, the necessary modifications were done, some questions were added and others were clarified or omitted.

3.6 Statistical analysis

SPSS software package (Stand for statistical product and service solutions version 16) was used for data analysis. Descriptive statistics including frequency, distribution, mean, and standard deviation were used to describe different characteristics. Chi-Square test was used to test the significance of results. Pearson correlation was conducted to show correlations between knowledge, attitude and practice scores among the studied

mothers. p-value of less than 0.05 was considered as denoting statistical significance. Reliability of attitude questionnaire by Cronbach alpha test (r alpha) were =.778.

3.7 Ethical considerations

An approval was attained from Research Ethnic Committee, Faculty of Nursing, Mansoura University, as well as an official permission were obtained from the director of each health unit in Damietta Governorate. An oral informed consent was obtained from each of the mothers who agreed to participate in the research after explaining the aim and the importance of the study. They were informed that they have the right to participate or not in the research. They were also assured about confidentiality of the obtained data and that they will be used for the research purpose only.

IV. Results

Table (1): Represents that the studied mothers aged 18 to 55 years with a mean of 29.67 ± 6.28, 559 (53.2%) of the studied mothers were aged 20 to less than 30 years.

Concerning the family numbers 578 (55%) of the families were composed of 1 to 4 members, while 472 (45%) of mothers, families were composed of more than 4 members.

Concerning mothers, occupation the same table revealed that 850 (81%) of the studied mothers were housewives and 1031 (98.2%) of them were married.

Regarding to their level of education, the table shows that 625 (59.5%) of the studied mothers had intermediate education and only 30 (2.9%) of them had primary education

Table (2): shows that 462 (44%) of the studied mothers had poor knowledge score while 328(31.2%) had good knowledge score,

Table (3): shows that 735 (70%) of the studied mothers had good attitude score, while the minority 6 (0.6%) of them had poor attitude score,

Table (4): shows that 373 (35.5%) of mothers had good practice score while 265 (25.2%) of them had poor practice score.

Table (5): Reveals that 211 (64.3%) of educated mothers with intermediate education and 91 (27.7%) mothers with higher education had a good knowledge. As for source of information 161 (49.1%) of the studied mothers who's acquired their information from health centers had a good knowledge. There were statistically significant associations between knowledge level and education and also with source of information (x2= 89.201 & 30.558 respectively at p< 0.001).

Table (6): shows that there were positive statistically significant correlations between mothers age and knowledge but it was a negative between age, attitude.

Table (1): Socio demographic data of the study participants (n=1050).

Socio-Demographic data	**No**=1050	**%**
Age		
<20	66	6.3
20 - < 30	559	53.2
30 - <40	401	38.2
≥40	24	2.3
Number of family member		
1 – 4	578	55.0
>4	472	45.0
Occupation		
House wife	850	81.0
Teacher	55	5.2
Nurse	85	8.1
Employee	28	2.7
Student	25	2.4
Engineer &doctor	7	0.7
Marital status		
Married	1031	98.2
Divorced/widow	19	1.8
Education		
Illiterate	76	7.2
Primary	30	2.9
Preparatory	36	3.4
Secondary	79	7.5
Intermediate	625	59.5
Higher education	204	19.4

Table (2): Distribution of the studied mothers according to their general knowledge about obligatory vaccination and knowledge scores of the study participants (n=1050).

Characteristics		
	N	**%**
Importance of vaccination		
-Prevent infectious diseases	980	93.3
-Maintain Child health	953	90.8
- Reduce child mortality rate	826	78.7
-Protect children from complication	754	71.8
Diseases controlled by obligatory vaccination		
-Measles	963	91.7
-Tuberculosis	890	84.8
-Poliomyelitis	1026	97.7
-Diphtheria, Tetanus and Pertussis diseases	817	77.8
-Hepatitis B virus	601	57.2
Contraindication		
-Malnutrition	208	19.8
-Diarrhea	671	63.9
-Minimal Infection	328	31.2
-Seasonal flu	542	51.6
-Immunological diseases	168	16.0
the routes of vaccine administration	443	42.2
Doses of vaccines		
-Polio	404	38.5
- BCG(Bacillus-Calmette-Guerin)	426	40.6
-DPT(Diphtheria, Tetanus and Pertussis)	258	24.5
- HBV(Hepatitis B)	239	22.7
MMR(Measles, Mumps and Rubella)	258	24.5
Knowledge score		
Poor (<50%)	462	44.0
Fair (50 – 65 %)	260	24.8
Good (>65%)	328	31.2

Table (3): Distribution of the studied mothers according to their attitude about obligatory vaccination and attitude score (n= 1050)

Characteristics	**Disagree**		**Uncertain**		**Agree**	
	N	**%**	**N**	**%**	**N**	**%**
Positive attitude Vaccination is important	3	0.3	12	1.1	1035	98.6
Vaccination is safe	0	0.0	71	6.8	979	93.2
vaccination maintain child health	5	0.5	24	2.3	1021	97.2
vaccination is the best for each infant	7	0.7	31	3.0	1012	96.4
recommend others to vaccinate their children	1	0.1	18	1.7	1031	98.2
Vaccination must give according to schedule	3	0.3	26	2.5	1021	97.2
Vaccination save the community	4	0.4	105	10.0	941	89.6
Effective in prevention of infectious diseases	2	0.2	220	21.0	828	78.9
Vaccination reduce mortality rate	7	0.7	264	25.1	779	74.2
Tetanus vaccine important for infant and mothers health	7	0.7	90	8.6	953	90.8
Negative attitude Vaccines have severe side effects	774	73.7	239	22.8	37	3.5
Infant Infected with the disease which immunized against	628	59.8	359	34.2	63	6.0
Side effects cause death	659	62.8	349	33.2	42	4.0
Vaccination important for boy than girls	857	81.6	168	16.0	25	2.4
vaccination is harmful	937	89.2	91	8.7	22	2.1
Attitude score	N			%		
Poor (<50%)	6			0.6		
Fair (50 – 65 %)	309			29.4		
Good (>65%)	735			70.0		

Table (4): Distribution of the studied mothers according to their practice about obligatory vaccination and practice score (n= 1050)

Characteristics	**No**		**Yes**	
	No	**%**	**No**	**%**
Your infant received vaccines according to Ministry of health schedule.	24	2.3	1026	97.7
Reported vaccinations side effects	59	5.6	991	94.4
-High temperature	53	5.0	997	95.0
-Rash	893	85.0	157	15.0
-Diarrhea	827	87.8	223	21.2

-Pain	456	43.4	594	56.6
Received anti-pyretic at vaccination day only.	492	46.9	558	53.1
Received anti-pyretic after vaccination	90	8.6	960	91.4
Swelling of the infant feet	276	26.3	774	73.7
Management of swelling				
-Cold compress	180	17.1	870	82.9
-Starch	910	86.7	140	13.3
-Analgesic and local anti-inflammatory	888	84.6	162	15.4
-Report doctor	463	44.1	587	55.9
Practice score	N		%	
Poor (<50%)	265		25.2	
Fair (50-65%)	412		39.2	
Good (>65%)	373		35.5	

Table (5): Associations between mothers, knowledge score and demographic data (n=1050).

Items	**Knowledge**						χ^2	**P**
Socio-demographic data	**Poor (n=462)**		**Fair (n=260)**		**Good (n=328)**			
	No	**%**	**No**	**%**	**No**	**%**		
Occupation								
Not employed	405	87.7	232	89.2	213	64.9	79.592*	<0.001*
Employed	57	12.3	28	10.8	115	35.1		
Education								
Illiterate	61	13.2	11	4.2	4	1.2	89.201*	<0.001*
Primary	22	4.8	5	1.9	3	0.9		
Preparatory	21	4.5	12	4.6	3	0.9		
Secondary	36	7.8	27	10.4	16	4.9		
Intermediate	257	55.6	157	60.4	211	64.3		
Higher education	65	14.1	48	18.5	91	27.7		
Source of information about obligatory vaccination								
TV	57	12.3	37	14.2	39	11.9	30.558*	0.001*
Radio	1	0.2	0	0.0	1	0.3		
Newspapers, school books	9	1.9	9	3.5	23	7.0		
Neighbours	3	0.6	4	1.5	9	2.7		
Health center	213	46.1	125	48.1	161	49.1		
TV and health center	179	38.7	85	32.7	92	28.0		
Health card	0	0.0	0	0.0	3	0.9		

$\chi 2$: Chi square test
*: Statistically significant at $p \leq 0.05$

Table (6): Correlation between mothers' age, knowledge, and attitude and practice score

Items	**Mothers' Age**	
	r_s	**P**
Knowledge	0.064	0.037
Attitude	-.058*	0.060
Practice	0.045*	0.145*

rs: Pearson coefficient
*: Statistically significant at $p \leq 0.05$

V. Discussion

Immunization has saved the lives of more children than any other medical intervention in the last 50 years. Vaccines are safe, simple and one of the most cost-effective ways to save and improve the lives of children worldwide12. Each year, two to three million lives are saved through immunization. However, more than 22 million children still go without basic immunization that leaving them susceptible to life-threatening illness and permanent disability. Immunizing children against vaccine-preventable diseases is an important factor in saving lives, increasing productivity, and alleviating poverty13.

The present study results reveals that less than one third of the studied mothers had good knowledge score related to children obligatory vaccination and more than one third of mothers had good practice score, while more than two third of participants had good attitude score. The results of the current study may be due to the low level of awareness, lack of educational program in rural areas and their positive attitude toward vaccination may be due to that parents knew that vaccination was mandatory and required for school registration.

These finding were in agreement with several studies; This study done at Mawatch Goth, Kemari town, Karachi 14 to assess knowledge, attitude and practices of mothers regarding immunization of one-year old child

this study revealed inadequate knowledge, strong positive attitude and limited practice of mothers. The other study carried in Peri-Urban Karachi 2 to assess mothers' knowledge about an Expanded Program of Immunization (EPI) and its relation with age-appropriate vaccination of infants which revealed that knowledge of studied mothers was inadequate. The results matched with study done in a Rural Area of North Kashmir, India to assess mothers' knowledge, attitude and practice about immunization of children 15 which illustrated good knowledge, good practice and good attitude of the studied mothers. . The same study was done in a traditional city in the United Arab Emirates16 and in Kosofe local Government area of Lagos state, Nigeria 17 which reported that good knowledge, positive attitude and good practice of mothers towards childhood immunizations Moreover other study was done in southwest Nigeria 18 to assess knowledge and perceptions of adult males towards childhood immunizations this results revealed good knowledge and good perceptions. However, Iraq study results 10 about parents' knowledge and practice regarding immunization related to pediatrics' immunization compliance revealed two third of parents' have adequate knowledge-practice scores. Which wasn't in the same line with the current study?

Regarding association between mothers, knowledge and sources of information about vaccination the present study revealed that there was a significant relationship this was in agreement with the study done in Kingdom of Saudi Arabia 19 which studied knowledge, attitude and practice of parents towards childhood vaccination revealed those whose source was TV showed higher significant total knowledge score ($p<0.001$). Similarly, those whose source was internet showed higher significant total knowledge score ($p<0.001$). Parents whose source of information was journals/newspapers showed higher significant total knowledge score ($p<0.049$), and the study done in Yenepoya University, Mangalore, Karnataka, India by Jose, Roshni, and Nisha, 20 who studied awareness on immunization among mothers of under-five children showed that there was a significant association between knowledge and exposure to mass media in relation to immunization among mothers of under five children as the calculated value is more than the table value at 0.05 level of significance.
Source of information already differs in understanding from TV, health worker, books, media etc. Regarding association between education and knowledge, in my study there is a relation between knowledge and education, mothers with intermediate and higher education had good knowledge than those with primary and illiterate ones, the difference between mothers, knowledge and education was statistically significant. This finding was in agreement with the study done in Taif region, Saudi Arabia 21 which studied knowledge and attitudes on childhood vaccination, a survey among Saudi parents, and also the study done in southwest Nigeria 18 which founded statistically significant association between respondents' level of education and their willingness to support childhood immunization and also matching with study carried in Peri-Urban Karachi 2 to assess mothers' knowledge about an Expanded Program of Immunization (EPI) and its relation with age-appropriate vaccination of infants which revealed mother's knowledge is strongly associated with her educational status, which in turn is associated with father's educational status but disagree with the study done in Al-Beida City, Libya to assess Knowledge, attitude and practices of mothers regarding immunization of infants and preschool children 22 revealed there was no significant relation between immunization status and mothers' educational level.

According to association between mothers, education and practice the present study showed that there was a statistically significant relation between education and practice. This finding was in the same line with the result done in Minia City, Egypt, 23 about mothers' awareness and knowledge of under five years children regarding immunization they described association between giving vaccination at time and mother's education. It was found that nearly half of higher educated mothers gave vaccination at time compared with half of illiterate mothers who didn't give their children vaccination at time with highly statistically differences.

Lack of education, can lead to reduced ability to find, understand and use health information. Thus, education is an important determinant of health status in developing world; well educated mothers had better health than the poorly educated, furthermore, education may change mothers' knowledge and perception of the importance of modern medicine in the care of their children.

Regarding correlations between mothers' age and knowledge, practice score in the current study the difference between mother's knowledge, attitude and age was satisfactory significant. These findings are in the same line with the results done in peri-urban Karachi to assess mothers' knowledge about EPI and its relation with age-appropriate vaccination of infants which revealed the knowledge score was found to have a statistically significant association with age appropriate vaccine coverage of children. This correlation between age and knowledge could be justified as the knowledge level differs from younger than older, young mothers may be are interested to watching TV, media and reading books than older mothers. Older mothers differ from younger in a variety of physical/biological, psychological/mental and social dimensions. In some cases these age-related differences (whether normative or pathologic) are disadvantageous to the older because their performance is diminished relative to that of the younger ones.

VI. Conclusion & recommendations

Conclusion:

Based on the findings of the present study, it could be concluded that:

- Less than half of the studied mothers had poor knowledge score, one third of the studied mothers had good knowledge score
- More than two third of studied mothers had good attitude score and more than one third of mothers had good practice.
- There were positive statistically significant correlations between mother's age and practice and the correlation between mothers, attitude and age was a negative one.

Recommendation:

- Health education campaigns about vaccination for mothers especially those in rural areas, slums, and villages emphasis on the less educated mothers.
- Immunization sessions should be held 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 .
- Provide mothers with vaccination booklets explain the importance of vaccination and how to manage its side effects also continuous educational programs for mothers about the types and availability of others vaccination are not included in obligatory ministry of health vaccination schedule.

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