Mothers' awareness and knowledge of under five years children regarding immunization in Minia city Egypt

Dr. Sanaa M. Ahmed[1], Dr. Tarek A. Abd-El Rahman[2] and Dr. Eman S. Masoed[1]

[1] Pediatric Nursing, Faculty of Nursing [2] Community Medicine, Faculty of Medicine, Minia University.
Magdy5871@yahoo.com

Abstract: Background: Vaccines are the greatest boon and achievement of modern medicine. Assessing immunization coverage helps to evaluate progress in achieving program objectives and in improving service delivery. **Objectives:** this study aimed to assess mothers' awareness and knowledge of immunization. **Design**: A cross sectional descriptive design was used. **Subjects and Methods:** This study included 97 mothers who were visited in four main Maternal and Child Health (MCH) Centers at Minia city. One tool was utilized to collect the necessary data**,** A structured questionnaire interview sheet. **Results:** It was found that nearly half 46.4% of higher educated mothers gave vaccination at time compared with 50% of illiterate mothers didn't give their children vaccination at time. And the majority of not working mothers 84.6% didn't give their infants vaccinations at time. It was noticed that all of illiterate mothers didn't know the hazards, compared with 86.4% of educated mothers mentioned that occurrence of disease. **Conclusion:** Many mothers don't come regularly for vaccination of their children. As a result they miss the due date of vaccination. Low literacy level of mothers is a matter of worry. Some of them don't know about the diseases for which their child is being immunized .Although many mothers don't know the timings of vaccination. **recommendations:** There is a dire need to arrange for health education program sessions for mothers of Under five years children with main emphasis on importance of vaccination, its timing & Vaccine Preventable Diseases**.**

[Sanaa M. Ahmed, Tarek A. Abd-El Rahman and Eman S. Masoed. **Mothers' awareness and knowledge of under five years children regarding immunization in Minia city Egypt.** *Life Sci J* 2013;10(4):1224-1232]. (ISSN: 1097-8135). http://www.lifesciencesite.com. 162

Key words: Under Five year's children, Immunization, Vaccine Preventable Diseases.

1. Introduction

The promotion of health is social as well as individual responsibility. It has been known that 5 million children were dying each year and another 5 million were disabled by infectious diseases **(WHO, 2001).**

The growth and development of children is a long term contribution of country as a whole. The key to attain the goal of health for all primary health care emphasizes on the preventive principles. One of the most cost effective health interventions is vaccine for all infectious disease. Immunization is a high priority area in care of infants and children. High immunization rates have almost eliminated many infectious diseases which used to decimate sizable of the population for countries. A number of deadly and disabling infectious diseases can be prevented by timely administration of vaccines when child is effectively immunized at the right age, most of these diseases are either entirely prevented or at least modified so that child suffer from a mild disease without any disability. **(Wong's, 2007).**

Immunization is one of the most effective, safest & efficient Public Health Interventions. While the impact of Immunization on childhood morbidity & mortality has been great, full potential, has not yet been reached. Still, Thousands of children die from Vaccine-Preventable diseases each year. **(Haneef *et al.*, 2006)**

Vaccines have eradicated small pox, eliminated wild polio virus in the U.S. and lastly Egypt. Also Immunization had significantly reduced the number of deaths of measles, diphtheria, rubella, Pertussis, and others, but despite these efforts, today tens of thousands of people in the U.S. still die from these and other vaccine preventable diseases**. (NIAM, 2007)**

The expanded program of immunization started by the WHO in 1974 and has improved coverage for BCG, DPT, polio and measles to about 80% of children in developing countries **(Loevinsohn and Hong 2006).** Over the past years, the Egyptian Ministry of Health and Population (MOHP) has implemented a national program for childhood immunization (DCD, 2005). Immunization is the most cost effective health intervention known to mankind. When countries can successfully provide vaccines to their children, they are already making an immense difference to the health of their citizens. But immunization alone is not sufficient because all areas of health care deserve attention and resources. **(Hong, 2005)**

Mortality rate may be greater in developing countries, because of low resistance of these children against infection. In the developing world some 23% of deaths among children under five years occur in the

first month. However about 3 million babies in the developing countries die during early childhood. In recent years however relatively low immunization levels in this age group have occasional scattered outbreak of certain disease. For this reason in spite of the national effort some immunizations are administered optionally to improve the immunization levels of all children. This vaccination helps to making the babies' immune system stronger. People who are duly partially immunized or not immunized at all may be at risk for the disease that these vaccines prevent. Still the people are unaware of the immunization Schedule and its importance. Hence the study plays an important role in spreading the awareness on immunization among the mothers of under five years children. (**Expanded Programme on Immunization. UNICEF, 2001**)

Assessing immunization coverage helps to evaluate progress in achieving program objectives and in improving service deliver. In addition, evaluation of immunization coverage provides evidence whether substantial progress towards achieving vaccination targets is being made **(Sharma & Hasin, 2008).**

The mother plays a major role in promoting the health of children. Several misconception, ignorance and inadequacy of knowledge in relation to optional vaccine is prevalent among mothers especially under five children (**kmatov *et al.*, 2007**).

Justification of the study:

Immunization is defined as the process by which individuals immune system becomes fortified against an immogenicoptional vaccine are those which are given according to one's own choice. Access to immunization services and up to date immunization coverage are essential for protecting every age group from debilitating and potentially life threatening effects of infectious diseases. The risk of mortality and morbidity is statistically high during childhood period. Prevention is ultimately the most effective defense system in controlling infectious diseases. So the knowledge regarding immunization in prevention of infectious disease among mothers of under five children is important. Keeping the point of view this study was conducted to assess the knowledge regarding optional vaccines among mothers with under five children (**Expanded Programme on Immunization. UNICEF, 2001**)

Aim of the study:

This study aimed to assess the mothers' awareness and knowledge of immunization

Research Questions:

What do the mothers know about immunization? What are the factors that may augment future competent awareness regarding immunization among mothers?

2. Subject and Method

Research design:-

A cross sectional descriptive research design was utilized in this study.

Setting:

The present study was conducted at all the Maternal– Child Health Care Centers (MCH) at Minia City. There were four MCH: - the north MCH centers the south, the east, and the west.

Subjects:

All attending the previous mentioned setting were included in the study. Their total number was 97 mothers after receiving their consents for participation in this study.

Criteria of inclusion:

1. Mothers who are having under five children and attending the routine immunization clinic of selected centers
2. Mothers who are willing to participate in the study

Criteria of exclusion:

Mothers who are not willing to participate in the study

Tools of data collection:

After reviewing the relevant literatures, one tool was utilized to collect data pertinent to study.

A structured questionnaire interview sheet*:* this included three parts:

- **Part *(1):*** Socioeconomic Status Scale: It was developed by (**Abd El-Twaab, 1998**); used to assess the socio-economic status of the mothers. It included four items; level of education (8 items), family income (6 items), job of parent, life styles (3 items). Each item have one score; the total score were divided into three classes as high degree from 85-100%, moderate from 60-84%, low less than 60%. It has been modified the item of income of social class by the researchers as following; according to the rate of inflation and increase to be conforming with recent income through comparing difference of the value of the golden pound at 1998 to that at 2012 and multiplying the rate of inflation to the scale.
- **Part *(2): Demographic characteristics of the child:*** as age, weight, height.
- **Part *(3): Assessment of knowledge*:** This part was developed by the researcher to assess knowledge of participants related to knowledge of immunizations. It included 9 questions regarding vaccination schedule, knowledge about vaccine-preventable diseases, history of vaccines received by the child, and reasons for non-vaccination, side effect of vaccinations, date of receiving vaccinations to the child, actions when side effects of vaccination occurred. Most of the questions on the survey instrument were close-ended.

- **Scoring**: for knowledge items, a correct response was scored one grade, and the incorrect zero. The scores of the items were summed upon the total divided by the number of items, giving a mean score for the part. These scores were converted into a percent score, and means and standard deviations were computerized. Knowledge was considered satisfactory if the percent score was 60% or more and unsatisfactory if less than 60%.

Methods of data collection:

Preparatory phase:

- Before starting this study, it was necessary to secure the approval of authorities in the setting of the study. Therefore, permission was obtained from the director of the Department of Health in Minia Governorate. Official permission was obtained from the directors of 4 Maternal and Child Health Centers and also from the ethical committee of faculty of nursing, Minia University.
- During this phase the researcher reviewed related literature, both local and international to acquire in-depth knowledge about the subject, and to be able to design the data collection forms. Then, the tools were prepared and reviewed by experts in nursing and medicine to ascertain their content validity.

Pilot study:

A pilot study was carried out on a sample of 10 mothers. The aim of the pilot was to test the clarity of the study tools. It helped in making necessary changes in the tools to detect data collection problems or difficulties. It also helped to determine the time needed for filling up the questionnaire. The time needed to fill out the sheet was 25-30 minutes. Following the pilot study, the questionnaire was finalized and made ready for use

Ethical Considerations

The researcher explained to mothers the aim of the study and informed that the information obtained would be confidential and only for the purpose of the study. Mothers have ethical rights to participate or refuse participation in the study. Consent to participate in the study was written from director and oral from mothers.

Field of the study:

Data collection was done by the researcher during the period from the beginning June until the end of -December 2012. The researcher interviewed each participated mother individually to obtain the necessary information. The actual work started by meeting the mothers throughout the morning time, The questionnaire was filled one day each week (day of routine vaccination), the researcher first introduced herself to them and gave them a complete back ground about the study then the sheet format, pre- designed by the researcher in Arabic Language, was distributed in order to collect the required data. The researcher was available for more clarification whenever needed. The number of mothers varied, with an average of 2-3 mothers in each time. The sheet required about 30-45 minutes to fill.

Statistical Analysis of data:

Data were analyzed using statistical package for social sciences (SPSS) version 20. Data were presented using descriptive statistics in the form of frequencies and Quantitative data were presented by mean and standard deviation, while qualitative data were presented by frequency distribution. Correlation analysis was used for assessment of inter relationship between the total score of performance A significance level was considered at $P < 0.05$.

3. Results

Findings of the present study revealed that a total of 97 mothers between age group of 20 to 40 years were assessed. Among these assessed 73% were in group 21-30 years with mean ±SD 28.4 years. In our study 70.1% were from urban and nearly one third of them were had higher education. As well as 74% were not working, finally the majority of them 73.2% were from middle socioeconomic status. About more than half 54.6% of their children were less than 6 months with mean±SD8.169 months. More than one third of them 39.2% were 2nd birth order, as well as the majority of them were 79.4% were breast feeding.

Figure (1): clarifies distribution of mother's awareness about vaccinations. It is obviously noted that more than half of them (54%) were mentioned three items of diseases (T.B, Measles and Hepatitis B) followed by don't know (25%).

Figure (2) shows mother's sources of information about diseases prevented by vaccines. It illustrates more than half of mothers their sources were T.V (54.6%) followed by nurses of the MCH (32%).

Figure (3) illustrates sources of mothers' information about time of vaccinations. It indicates that about more than third of mothers (45.4 %) gain their information from street advertise then, (31.9%) from birth certification.

Figure (4) Portrays mother's information about side effect of vaccinations . It was found that the most of the mothers (68.0 %) had adequate base line information .

Figure (5) illustrates mothers' awareness about side effect of vaccinations. It indicates that about more than third of mothers (39.4 %) had answered by both of fever and diarrhea, followed by fever, flu and cough (34.8%).

Table (1) shows associations between educational status and knowledge about vaccine preventable disease. It was assessed as, those mothers who could name at least one vaccine preventable disease were considered as having knowledge and

those who couldn't even name a single vaccine were taken as not having any knowledge in any educational status. The educated mothers had some knowledge about vaccine preventable disease 45.8% with no significant differences.

Table (2) describes association between giving vaccination at time and mother's education. It was found that nearly half 46.4% of higher educated mothers gave vaccination at time compared with 50% of illiterate mothers didn't give their children vaccination at time with high statistically differences (p=0.001).

Table (3) describes association between giving vaccination at time and mother's work. It indicates the majority of not working mothers 84.6% didn't give their infants vaccinations at time, with high statistically differences. (p =0.01).

Table (4) Portrays the relations between mother's education and reason of not vaccine of the child. It was found the most often mentioned reason for not vaccine, was family trouble and time of vaccine 100% between higher educated mothers followed by had no time 60%, with no significant differences.

Table (5) illustrates relations between mother's education and knowledge about Contraindication of vaccinations. It indicates that about 66.7% of higher educated mothers mentioned growth affection followed by 50% disease occurred of secondary educated, with high statistically differences. (p =0.00001).

Table (6) Deals with relations between mother's work and hazards of not vaccine the child. It noticed that all of illiterate mothers didn't know the hazards, compared with 86.4% of educated mothers mentioned that occurrence of disease with high statistically difference (p =0.008).

Table (7) shows relations between total knowledge score about vaccination and mother's characters. It indicates that urban with moderate socioeconomic status had good total knowledge score (83.8%) with statistically difference (P=0.01, p =0.02). while not working mothers and illiterate had poor total knowledge score (84%, 40% respectively).

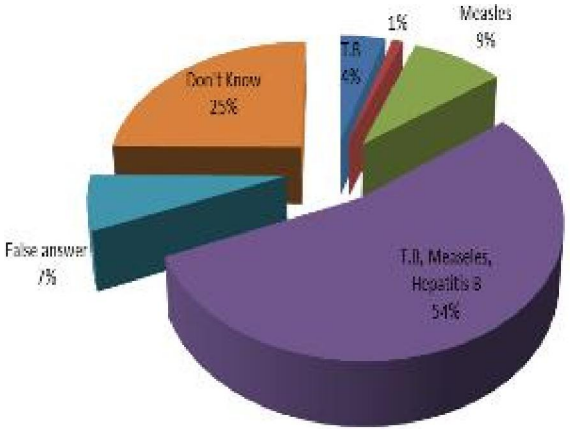

Figure (1) mother's awareness about diseases preventing by vaccines

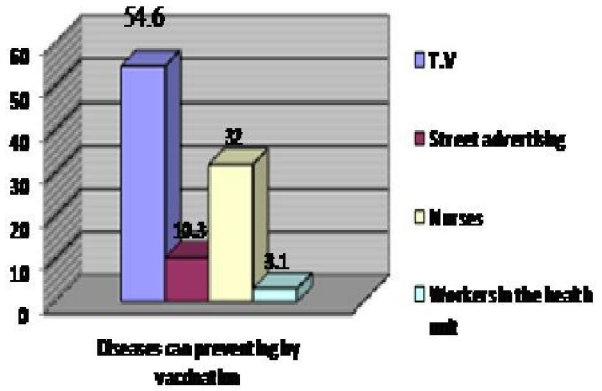

Figure (2) Mother's sources of information about diseases preventing by vaccines

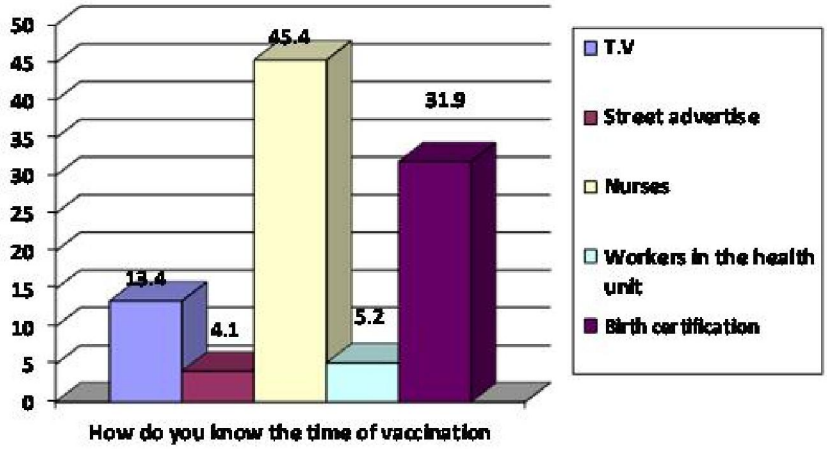

Figure (3) Sources of information about time of vaccinations

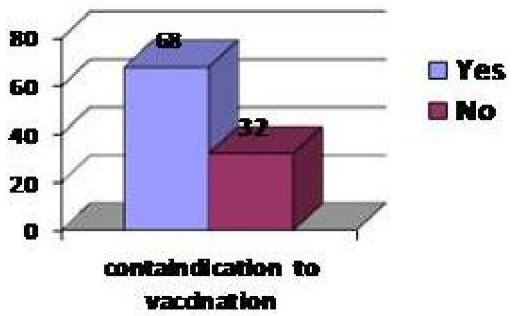

Figure (4) mother's information about contraindication of vaccination

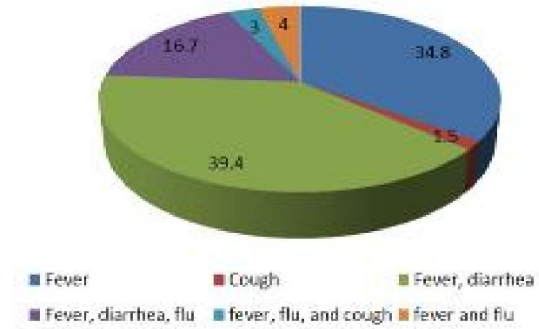

Figure (5) mother's awareness about side effect of vaccinations

Table (1) Associations between educational status and knowledge about vaccine preventable disease.

	T.B		Pertussis		Measles		3 or more of vaccine disease		False answer		Don't know		Fisher exact	*P*-value
	No	%	No	%	No	%	No	%	No	%	No	%		
Mother education														
Illiterate	1	25	0	0	2	25	5	10.4	1	16.7	9	40.9	16.214	0.982 NS
Primary	0	0	0	0	1	12.5	3	6.2	0	0	1	4.6		
Preparatory	0	0	0	0	0	0	1	2.1	0	0	0	0		
Secondary	1	25	0	0	3	37.5	17	33.3	2	33.3	5	22.7		
Higher	2	50	1	100	2	25	22	45.8	3	50	7	31.8		
Master degree	0	0	0	0	0	0	1	2.1	0	0	0	0		

Table (2) Association between giving vaccination at time and mother's education

	Vaccination at time				X^2	*P*-value
	Yes		No			
	No	%	No	%		
Mother education						
Illiterate	8	11.6	14	50	20.858	0.001*
Primary	4	5.8	1	3.6		
Preparatory	1	1.4	0	0		
Secondary	24	34.8	7	25		
Higher	32	46.4	5	17.9		
Master degree	0	0	1	3.6		

Table (3) Association between giving vaccination at time and mother's work

	Vaccination at time				X^2	*P*-value
	Yes		No			
	No	%	No	%		
Mother work						
Yes	23	27.4	2	15.4	8.022	0.01*
No	61	72.6	11	84.6		

Table (4) relations between mother's education and reason of not vaccine of the child

	Reason not vaccine														Fisher exact	*P*-value
	Forget		No time		Travel abroad		Family troubles		Vaccine time		Never happened		Others			
	No	%	No	%	No	%	No	%	No	%	No	%	No	%		
Mother education																
Illiterate	4	57.1	0	0	0	0	1	100	0	0	0	0	0	0	21.559	0.606 NS
Primary	0	0	1	20	0	0	0	0	0	0	0	0	0	0		
Preparatory	0	0	1	20	0	0	0	0	0	0	0	0	0	0		
Secondary	2	28.6	0	0	1	50	0	0	0	0	1	50	1	100		
Higher	1	14.3	3	60	1	50	0	0	1	100	1	50	0	0		

Table (5) Relations between mother's education and knowledge about effect of vaccination on the child.

	knowledge about effect of vaccination on the child									
	Disease occurrence		Growth affection		Do not know		disease occurrence, Growth affection		X^2	*P*-value
	No	%	No	%	No	%	No	%		
Mother education										
Illiterate	12	27.3	3	11.1	5	83.3	2	9.5	44.941	0.00001**
Primary	1	2.3	1	3.7	0	0	3	14.3		
Preparatory	0	0	1	3.7	0	0	0	0		
Secondary	22	50	4	14.8	1	16.7	5	23.8		
Higher	8	18.2	18	66.7	0	0	11	52.4		
Master	1	2.3	0	0	0	0	0	0		

Table (6) Relations between mother's work and knowledge about effect of vaccination on the child.

	knowledge about effect of vaccination on the child									
	Disease occurrence		Growth affection		Do not know		disease occurrence, Growth affection		X^2	*P*-value
	No	%	No	%	No	%	No	%		
Mother work										
Yes	6	13.6	12	44.4	0	0	7	33.3	11.744	0.008*
No	38	86.4	14	51.9	6	100	14	66.7		

Table (7) Relations between total knowledge score about vaccination and mother's characters.

Socio-demographic characteristics	Total knowledge about vaccinations						$\chi 2$	*P*- value
	Poor		Satisfied		Good			
	No	%	No	%	No	%		
Residence								
Urban	12	48	25	71.4	31	83.8	9.161	0.01*
Rural	13	52	10	28.6	6	16.2		
Education of the mother								
• Illiterate	10	40	5	14.3	7	18.9		
• Primary	0	0	2	5.7	3	8.1		0.244
• Preparatory	0	0	1	2.9	0	0	12.646	NS
• Secondary	5	20	15	42.9	11	29.7		
• Higher	10	40	12	34.3	15	40.5		
• Master degree	0	0	0	0	1	2.7		
Occupation of the mother								
Working	4	16	11	31.4	10	27	1.864	0.394
Not working	21	84	24	68.6	27	73		NS
Socioeconomic status								
• Low	12	50	7	20	6	16.2	11.309	0.02*
• Middle	12	50	27	77.1	31	83.8		
• High class	0	0	1	2.9	0	0		

4. Discussion

The results of the study give us some impression about the level of awareness and knowledge to immunization among mothers.

The result of current study revealed that about two third of mothers from urban areas with mean age 28.4 years. The study results agreed with **Rachna and Sheetal (2010),** who reported that their study mothers were 28 years, while it was 27.3 years in study conducted by **Adeyinka (2009).**

The first dimension that has been explored in the present study was the assessment of awareness about vaccinations that mothers have. According to our present study finding that more than half of them were mentioned three items of diseases (T.B, Measles and Hepatitis B) followed by don't know (25%).

While, **Rachna and Sheetal (2010),** found maximum number of respondents (85 %) knew about Poliomyelitis while measles & Tuberculosis was known to 40% & 35 % of respondents, as well as in the study conducted by **Sharma & Bhasin(2008)** 5 maximum number of respondents (61 %) knew about measles followed by tuberculosis (52.5%). Knowledge about Hepatitis B was very less & at par in both studies.

Also, the present results revealed that more than half of mothers their sources of information about diseases prevented by vaccine were T.V, followed by nurses of the MCH .these results were agree with **Rachna and Sheetal (2010),** who found that mothers got the awareness about immunization through television and internet. While in the study conducted by **Adeyinka (2009).** 65.7 % of the respondents got information about Vaccine Preventable Diseases from Antenatal clinics & role of media was only 4.8%

In addition, the present study showing that about more than third of mothers gain their information about time of vaccinations from street advertise then, from birth certification. These results are in disagreed with **Bofarraj (2012).** Who found the paramedical worker, was found to be the major source of information to the attendants (50.2%).

Furthermore, our study noticed that more than third of mothers (39.4 %) had answered by both of fever and diarrhea, followed by fever, flu and cough (34.8%) about side effect of vaccination. This finding is incongruence with **Adeyinka (2009).** Who stated that 2% of the mothers volunteered that immunization could cause infertility. Other ill-effects of immunization as thought by the mothers are fever (8.2%), deformity (5%), convulsions (2.4%), and diarrhea (2.2%). This may be due to misinformation from friends or relatives.

The second dimension that has been explored in the present study was the assessment of mothers' knowledge about vaccinations in order to evaluate the basic knowledge that mothers have. According to our present study finding the educated mothers had some knowledge about vaccine preventable diseases. This finding is in the line with **Bernsen *et al.* (2011)**. Who found that the knowledge score was lower in those women who didn't have education or have low educational standard.

Concerning giving vaccination at time, our study indicated that nearly half of higher educated mothers gave their children their vaccinations at time. This finding is in congruence with **Bofarraj (2012).** Who found that no significant relation between immunization time and mother's educational level.

According to the present study, the majority of not working mothers didn't give immunizations at time. This may be attributed to forgotten the time of vaccine. Finding is in consistent with the finding of other studies **Singh *et al.* (1994), Quaiyum (1997) and Nath *et al.* (2008).** Who found that the mother's job didn't affect the child's immunization. In the same line **Adeyinka (2009) who found that** no significant association between the immunization status and the occupation of the parents or educational status. This may be due to the fact that intense health education has made immunization appear customary irrespective of social class.

All of illiterate mothers mentions that the reason for not vaccine their children was family trouble and the time of vaccine. This contradicts with **Bofarraj (2012).** Who found that the most often mentioned reasons for incomplete vaccinations was child sickness, followed by social reasons and forgetfulness.

Our study showed that all of illiterate mothers didn't know the effect, compared with the majority of educated mothers mentioned that occurrence of disease with high statistically difference. This is at variance with **Adeyinka (2009) who stated that** 2% of the mothers volunteered that the hazards of not giving immunization could cause infertility. Other ill-effects as thought by the mothers are fever (8.2%), deformity (5%), convulsions (2.4%), and diarrhea (2.2%). This may be due to misinformation from friends or relatives.

It was viewed in the present study indicated the urban with moderate socioeconomic status had good total knowledge score with high statistically differences when comparing with illiterate and not working mothers had poor total knowledge score with no significant differences these finding is in support with **Bernsen *et al.* (2011)**. Who found that low socioeconomic status may play role in mother's knowledge about immunizations. And **Barman and Mahanta (2009) & Akhtar *et al.* (2009)** who stated that factors that affect immunization completion rates. Low parental, specifically maternal literacy and knowledge regarding vaccines and immunization schedule, poor socioeconomic status, and residence in rural areas are associated with low immunization coverage

Finally, we believe that our study represents one of the most comprehensive attempts to document the Awareness and knowledge of mothers of under five children regarding immunization. As with any research, however, there are several limitations to this study that should be considered when interpreting our results. The results of this study may not generalize to other populations of mothers. In recent years, the community in which this study took place has experienced difficult economic conditions. In addition, the system for identifying mother's

knowledge in Minia City may vary somewhat from others.

Conclusions

Based on the results of the present study, Many mothers don't come regularly for vaccination of their children. As a result they miss the due date of vaccination. Low literacy level of mothers is a matter of worry. Some of them don't know about the diseases for which their child is being immunized .Also many mothers don't know the timings of vaccination.

Recommendations:

There is a dire need to arrange for health education program sessions for mothers of Under five children with main emphasis on importance of vaccination & Vaccine Preventable Diseases (VPDs).

The role of MCH clinic as a source of awareness should further be strengthened by training more health care workers since majority of the respondents got informed about immunization in the MCH clinic.

This clearly signifies the importance of audio visual media which can be taken as means of communicating ideas and information about health and medicine to a mass audience.

Finally we should recommend that more television coverage should be given to vaccine preventable diseases. More funds should be allocated to launch such programs through mass media for the communicable disease in our country.

Correspondence author name:
Dr. Eman Sayed Masoed
Pediatric Nursing, Faculty of Nursing, Minia University
Magdy5871@yahoo.com

References:

1. **Adeyinka D**. Uptake of Childhood Immunization among mothers of Under Five in South Western Nigeria. The Internet Journal of Epidemiology, 2009; 7; Number 2: 54-66
2. **Akmatov, M. K.,** Kretzschmar, M., Krämer, A., and Mikolajczyk, R. T. (2007): 'Determinants of Childhood Vaccination Coverage in Kazakhstan in a Period of Societal Change: Implications for Vaccination Policies', *Vaccine*, Vol-25, pp-1756-63.
3. **D.A. Adeyinka,** O. Oladimeji, F.E. Adeyinka, C. Aimakhu: Uptake Of Childhood Immunization Among Mothers Of Under-Five In Southwestern Nigeria. The Internet Journal of Epidemiology. 2009 Volume 7 Number 2. DOI: 10.5580/f4:1-15
4. **Division of Communicable** Disease control (DCD). Future directions for achieving the communicable disease control targets of 2005. *DCD Newsl,* **2005**, *5*, 1-12.
5. **Expanded Programme** on Immunization. UNICEF programmes in South and Center of Iraq. UNICEF response to prevent child deaths, diseases and disabilities from the six preventable disease June 2001 last update. [Cited 2002 July 24]. Available from: URL: http://www.pdh.sdnpk.org/expand-prog-immunization.html.
6. **Haneef SM**, Maqbool S, Arif MA. Immunization general considerations. Textbook of paediatrics, 1st ed. Pakistan Paediatric Association, International Book Bank, 2006: 341.
7. **Hong R, Banta** JE. Effects of extra immunization efforts on routine
8. immunization at district level in Pakistan. East Mediterr Health J 2005; 11: 745-52.
9. **Loevinsohn B,** Hong R, Gauri V. Will more inputs improve the delivery of health services? Analysis of district vaccination coverage in Pakistan. Int J Health Plann Manage 2006; 21: 45-54.
10. **Mabrouka** A.M. Bofarraj. Knowledge, attitude and practices of mothers regarding immunization of infants and preschool children at Al-Beida City, Libya, 2008; Egypt J Pediatr Allergy Immunol 2011; 9(1):29-34.
11. **Nath B, Singh** JV, Awasthi S, Bhushan V,Kumar V, Singh SK . KAP Study on immunization of Children in a City of North India- A 30 Cluster Survey. OJHAS 2008; 7(1): 2-10.
12. **NIAM,** National Immunization Awareness Month, Aug 2006. National Immunization programme, NIP Events, main page 6/3/2007.
13. **Phukan RK, Barman** MP, Mahanta J: Factors associated with immunization coverage of children in Assam, India: over the first year of life. J Trop Pediatr 2009, 55:249-252.
14. **Quaiyum MA, Tunon** C, Hel Baqui A, Quayyum Z, Khatun J. Impact of national Immunization days on polio-related knowledge and practice of urban women in Bangladesh, Health Policy Plan 1997;12:363-71.
15. **Rachna Kapoor** and Sheetal Vyas. Awareness and knowledge of mothers of under five children regarding immunization in

Ahmedabad. Healthline Journal, 2010 Jule-Desember (1); 12-15.

16. **Rahul Sharma** & Sanjiv K hasin. Routine Immunization—Do People Know About It ? A Study Among Caretakers of Children attending Pulse Polio Immunization in East Delhi. Indian Journal of Community Medicine. 2008 January, 33(1); 31-34
17. **Roos M. Bernsen**, Fatmah R. Al-Zahmi, Noura A. Al-Ali, Rowayah O. Hamoudi, Noura A. Ali, John Schneider, Jamal Al-Mutawa and Michal Grivna. Knowledge, Attitude and Practice towards Immunizations among Mothers in a Traditional City in the United Arab Emirates. Journal of Medical Sciences, 2011; 4(3): 114-121.
18. **Singh MC,** Badole CM, Singh MP. Immunization coverage and knowledge and practices of mothers regarding immunization in rural area. Indian J Public Health 1994; 38(3): 103-7.
19. **Usman HR, Akhtar S, Habib** F, Jehan I: Redesigned immunization card and Center-based education to reduce childhood immunization dropouts in urban Pakistan: a randomized controlled trial. Vaccine 2009, 27:467-472.
20. **Wong's, D.L.** (2007). Nursing care of infants and children. (7th edition). India: Elsevier publishers.
21. **World Health Organization**, United Nations Children Fund. The state of the world's children. UNICEF Geneva: 2001, pp. 77-89.
22. **World Health Organization**, United Nations Children Fund. The state of the world's children. UNICEF Geneva: 2007, pp. 83-103.

10/12/2013