Mothers' knowledge Regarding Immunization of Infant at Barber Health Center, River Nile State, Sudan (2017)

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B.Sc. in Nursing Sciences, University of Gezira (2011)

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Mothers' knowledge Regarding Immunization of Infant at Barber Health Center, River Nile State, Sudan (2017)

Myssa Bakheit Hassan Ali

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Mothers' knowledge Regarding Immunization of Infant at Barber Health Center, River Nile State, Sudan (2017)

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Date of Examination: 1/4/2018
سورة لقمان (٧)
Dedication

To my father, mother, brothers and my sister who gave me all their best wishes and support in all my decisions.

To my lovely partners and my best friends.

I am so cheerful to dedicate this research for them.
Acknowledgement

First of all, I would like to take this opportunity to thank the greatest Allah for blessing my efforts to accomplish this research.
Secondly, I am very delighted to express my profound compliments and gratitude for my main supervisor Dr. Ietimad Ibrahim Kambal and my co-supervisor Dr. Ekhlas Mohammed Ali Ahmed whose valuable consultancies, constructive advices, and guidance has contributed a lot in achieving this submission. Thanks are also extended to the staff of Faculty of Applied Medical Science of Gezira University for their encouragement and support during the years of the study. I am greatly indebted to all of the respondent mothers who attended to Barber Health Center for answering the entire questions included in the questionnaire forms voluntarily and friendly and provided me with reliable data on which I based the study results, conclusion and recommendations.
Finally, I would like to extend my appreciations and warmly thanks to my family whose support and encouragement made this task a successful one.
Mothers' knowledge Regarding Immunization of Infant at Barber Health Center, River Nile State, Sudan (2017)

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Abstract

Immunization is defined as an effort to prevent or modify natural infection by administration of antigen or antibody. Vaccine action is used to prevent specific infectious diseases. The role of mothers as essential members on the immunization process is to know the timing of immunization, observe any complication, and know how to deal with side effects and to inform the Doctor if any abnormality appears on their children. A descriptive hospital based study was conducted at Barber Health Center, River Nile state, Sudan. during the period (January 2016 to December 2017). The study aimed at assessing mothers' knowledge regarding immunization of their children in the first year of age. The sample size consisted of (210) mothers who visited the center during the study period. Data was collected through using a questionnaire designed for the purpose of this study. Data analysis was performed by using Statistical Package of Social Sciences (SPSS) version 16. The results of this study showed that the average knowledge of the respondent mothers regarding definition, type and goal of immunization was 66.1%, with regard to side effects and how to deal with such side effects of immunization it was 91.6%. Regarding timing of immunization the mothers had scored 95.7% as average knowledge. As for mothers' preference of immunization for their children they scored 95.3%, and 97.6% of mothers mentioned availability of cards. On other hand the mothers' average knowledge regarding definition, signs, symptoms and complications of measles, diphtheria, rotavirus, poliomyelitis, whooping cough and tuberculosis was found to be (69.5%). Therefore, the study concluded that the overall mean knowledge of mothers was (70.7%) which is considered good knowledge with regard to immunization process as measured against the knowledge assessment scale. This conclusion is supported by the fact that 77.1% of mothers completed vaccination of their children. The researcher recommended improving social mobilization regarding importance of immunization in collaborating with community, health agents, local religious leaders, and women groups' representatives, UN agents, NGOs... etc, as well as using mass media to increase outreach and enhance health education to be more effective and focus on raising the community awareness.
دراسة

العنوان: معرفة الأمهات تجاه تطعيم الأطفال في السنة الأولى من العمر في المركز الصحي ببربر، ولاية نهر النيل، السودان (2017)

المؤلفة: ميساء بخيت حسن علي

ملخص الدراسة

يدعى التطعيم بأنه المسعى لمنع أو تجوير العدوى الطبيعية بإدارة الأجسام المضادة كما يستخدم مفعول اللقاح لمنع الأمراض المعدية تزداد. يتضمن دور الأمهات كعضاو أساسي في عملية التطعيم في معرفة مواضع التطعيم الروتينية وملاحظة أي مضاعفات وكيفية التعامل مع الآثار الجانبية وإبلاغ الطبيب في حالة وجود أي أعراض وعلامات غير طبيعية تظهر على أطفالهن. أجريت هذه الدراسة الوصفية بالمركز الصحي ببربر، ولاية نهر النيل، بالسودان، خلال الفترة من يناير 2015 إلى ديسمبر 2016. هدفت هذه الدراسة إلى تقييم معرفة الأمهات تجاه تطعيم أطفالهن في السنة الأولى من العمر. تم جمع البيانات من خلال استخدام استمارة استبيان صممت لغرض هذه الدراسة. كما تم تحليل البيانات باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS) النسخة 16. أوضحت نتائج هذه الدراسة أن متوسط معرفة الأمهات فيما يتعلق بتعريف ونوع وهدف التطعيم كانت (66.1%)، أما فيما يتعلق بمتوسط معرفتهم للأثار الجانبية وكيفية التعامل مع هذه الآثار فقد بلغت (91.6%). بالإضافة إلى مواعيد التطعيم فقد أحرزت الأمهات (99.7%) متوسط لمعرفتهم. كما ذكرت (97.6%) من الأمهات وجود كروت التطعيم. ومن ناحية أخرى فإن متوسط معرفة الأمهات تجاه تعريف علامات أعراض مضاعفات الحصبة، الدفتيريا، الأسمى، السعال الديكي والدرن قد بلغت (69.5%) وعليه فقد خلصت الدراسة إلى أن المتوسط العام لمعرفة الأمهات قد بلغ (70.7%) وتعتبر هذه معرفة جيدة بعملية التطعيم وفقاً لمعايير تقييم المعرفة. بما يدعم هذه الخلاصة أن (77.1%) من الأمهات قد أكملن تطعيم أطفالهن. توصي الدراسة بتحسين عملية التحريك الاجتماعي تجاه أهمية التطعيم بمشاركة المجتمع، وكلاء الصحة، القيادات الدينية المحلية، وسائل الإعلام، والمنظمات الإغاثية، والذين يستخدم وسائل الإعلام لزيادة الإشارات ودعم التعليم الصحي ليكون أكثر فاعلية.

ويتركز لرفع وعي المجتمع.
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Chapter One

Introduction
1- Introduction

1-1 Background:

Immunization is defined as an effort to prevent or modify natural infection by administration of antigen or antibody. Vaccine action is used to prevent specific infectious diseases. They may be given when the individual is immunologically capable and before exposure to natural infections (Jamal M., et al, 2003). In developing countries the preventable disease continues to be endemic, less than 10% of children in developed countries are immunized against these diseases. In developed countries measles kills between 7 to 8 million children yearly and there are 135 million cases per year worldwide. Immunization includes passive immunization and active immunity (centers of disease cp., et al, 2014). Passive immunization means passage of maternal antibodies to the fetus through the placenta in the last trimester. Antibodies against measles, polio myelitis, diphtheria, scarlet fever and mumps can cross the placenta. Antibodies against whooping cough cannot cross the placenta because they are large in size (1gm in size). Maternal antibodies disappear from the infant's circulation by the 3rd – 6th month of life. Artificial immunization is done by administration of immune globulins (convalescent sera hyper immune sera or gamma globules). Antibodies in such preparation may be antiviral, antibacterial or antitoxin either alone or in combination (Jamal M., et al, 2003). Active immunity is entry of antigens which stimulate formation of antibodies by the immune system. Natural by acquiring the infection either sub-clinically or clinically is lifelongly in measles, German measles, chicken pox and mumps. But when more than immunologic strain exit, e.g. in polio myelitis and influenza, second attack may occur caused by different strain. Acquired by vaccines which may be viral, bacterial or toxins the live attenuated: B C G. Polio (sabin), killed: polio (salh). Modified toxin: (ditherier, tetanus). Family live and medical care was dominated by epidemics of infectious disease that caused morbidity and mortality for the children population. Deaths are often to six deadly diseases: Measles, Tuberculosis, Tetanus, Whooping, Diphtheria and Poliomyelitis (Ropert N., et al, 2002).

These serious illnesses affect happiness and economic wellbeing of whole family. Prevention is always better than cure as it is much more cost effective to protect people
from disease by immunization than to treat them when gentiles. These infectious diseases are prevented by immunization which is available in from of vaccine and it gives serious cage to childhood. Mothers' responsibility is to maintain good family health; therefore mother' knowledge is important issue as she plays a big role in protecting children from these diseases.

1-2 Problem Statement:

Worldwide: 12.9 million infants did not receive any vaccination in 2016 according to WHO and UNICEF immunization estimates, this means critically that these infants missed the first dose of (DPT) containing vaccine, putting them at serious rising of fir potentially fatal disease.

In developed countries the factors that most affect immunization coverage involve the global policy environment and contact with international agencies. In very poor countries' democracies the quality of country institution and the level of the development are also strongly related to immunization rate coverage and vaccine adaption, there is no evidence that diseases out breaks or polio eradication campaigns affect immunization.

In developing countries Measles kills between 7-8 million children yearly and 135 million cases per year worldwide. Whooping cough case fatality rate is 4.15% in infants and 10% in children. Diphtheria true number is unknown because of incomplete reporting from most countries. Tetanus is often highest in areas at high risk for Tetanus.

In Sudan: in 1993 a large outbreak of paralytic polio myelitis occurred in Sudan as the result of susceptible children that was accelerated by faltering immunization services. Measles killed two children every hour in Darfur. Diphtheria crude mortality rate is 2.9 deaths per 10.000 people while in north Darfur is 1.5 deaths.

Tuberculosis mortality rate of under-five is 112 deaths per 1.000 live births; 68% of children have not been fully immunized.

Whooping cough: 175 children have died from whooping during recent outbreak in south Sudan more than 850 cases have been confirmed.
1-3 Justification:

As mentioned earlier, Measles kills between 7-8 million children yearly and 135 million cases per year worldwide. Sudan is also affected by poor immunization services for children as diphtheria crude mortality rate is 2.9 deaths per 1000 live birth, tuberculosis mortality rate of under-five is 112 deaths per 1000 live births; 68% of children have not been fully immunized, in case of whooping cough 175 children have died during recent outbreak in the South of Sudan and more than 850 cases have been confirmed. Thus, mothers are essential members in immunization process, and they are considered the main responsible person for the child, therefore it is important to have information about vaccination. They also know everything about their children from age of birth, such as disease – weight – breast feeding, type of feed any sensitivity from any drags and what happens after immunization process. Deterioration in the level of education in developing countries leads to decrease mothers' knowledge and practice about immunization process which may be lead to death. The purpose of this study is to assess mothers' knowledge regarding immunization of children at age of one year.

Few studies have been conducted in this area via Saida Alsdic at Khartoum University about mother knowledge regarding immunization of child process.

1-4 Objectives:

1-4-1 General Objective:

To study mothers' knowledge regarding Immunization of children at age of one year at Barber health center, River Nile state, Sudan during the period from January 2016 to December 2017

1-4-2 Specific Objectives:

a. To assess mothers' knowledge regarding immunization coverage among children at age of one year. During the period from January 2016 to December 2017

B. To asses mothers knowledge with regard to complication and how to deal with side effect.
Chapter Two

Literature Review
2- Literature Review

2-1 Introduction:

Immunity is the ability of body to resist infection. Vaccine is medicine made from microorganism. It is administered to prove and prevent person from dangerous disease. Immunization means giving person vaccine to prevent him from contracting serious illness. And vaccine action is used to prevent specific infectious diseases. They may be given when the individual is immunologically capable and before exposure to natural infections. With regard to types of immunity there are 2 types, active immunity and passive immunity (levene p., et al, 2000).

2-2 Specific Immunity:

It is immunity which is resulted of infection by specific immunization and is usually associated with presence of antibodies cells which having specific action, and microorganisms concern particular infectious disease or anti toxin.

There three types of active immunity:

a) Following clinical infection e.g, chicken pox. rubella
b) Following sub clinical in parent, e.g polio and diphtheria.
c) Following immunization with an antigen may be killed vaccine, live attenuated vaccine or toxoid (levene p., et al 2000).

2-3 Immune Response:

A. Primary response:

when antigen is administered for the first time to an animal or human who has never been exposed to it, there is later period incubation from 3-10 days before antibodies appear in the blood is elicited first is entirely the type rise during the next 2-3 days or more, reaches peak level, then gradually days. It reaches peak level 7-10 days and then gradually falls over a period of a weeks or month (park k., et al, 2007).
B. Secondary response:

Is also involves the production of 1 GM antibodies collaboration between b and t cells is necessary is a brief production of 1GM and much larger and more prolonged production antibody.

2-3-1 Active Immunity:

1- Humeral immunity:

Come from the B – cells (bone marrow derived lymphocytes) which proliferate and manufacture specific antibody after antigen presentation by microphages. The antibodies are localized in the immune globulins fraction of the serum immune Globulin is divided in to 5 g1 and 1 g E (park k., et al, 2007).

2- Cellular immunity:

Although antibodies are effective in combating most infectious diseases, humeral immunity does not cover the entire situation that one find in infection disease. Cellular immunity plays fundamental role in resistance to infection.

It is mediate by cell which differentiates into sub – population able to help B- lymphocytes the T- cell do not secrete antibody , but are responsible for recognition of antigen . The importance of cell – mediated immunity can be appreciated from the fact that a child bone which a defect in humeral antibody production may survive for long 6 years without replacement therapy but a severe defect in cell – mediated will result in within the first six months of life.

3- Combination of the passive immunity:

B and T lymphoid cell they cooperate with one another. And with certain accessory such as macrophages and human killer cells and they constitute the complex events of immunity.

2-3-2 Passive Immunity:

When antibodies produce animal is transferred to another to induce production, it is known passive immunity. In other word the body does not production it is own antibodies but depend up on ready – made antibodies passive immunity many be induced B.

A. administration of antibody – containing preparation (immune globulin are anti – serum).
B. transfers of maternal antibodies across the placement human milk also contain protective antibodies (1GA).

C. transfer of lymph nodes to induce passive cellular immune Go – this procedure is still experimental.

1- 1GA.
2- 1GM.
3- 1GA.
4- 1GD.

Hard immunity:
It is level of resistance of community or people to particular disease. (levene p., et al, 2000).

2-4 Vaccines:
Vaccine is an immune – biological substance design to produce specific protection against given disease. It stimulates the production of protective antibody and other immune mechanisms.

( Ropert N., et al, 2002)

Vaccine may be prepared from:

a) Live modified organisms.

b) Inactivated or killed organisms.

c) Extracted cellular factions.

d) Toxoid.

e) Combination of theses.

2-4-1 Live Vaccine:
Live Vaccine (e.g. BCG, measles. oral polio is prepared (generally attenuated) organism

2-4-2. Immune Goblins:
Human immune – globulins systems composed of 5 major classes:

1- GE.
2- GA:

It is the major immune globulins of serum about 85% of the total serum, and it can diffuse into the intestinal fluid. Only classes of Ig which is transported across the placenta. (Park k., et al, 2007).

3- GM:

It is account for about 10% normal serum immune globulins. It present antibody that is a promptly formed with exposure to antigen.

4- IGA:

It constitutes about risk of the total serum immune globulins, it found relatively in large quantities Body secretion e.g. alive, milk, and colostrum. Tear nasal mucosa, prostatic fluid vaginal secretion and mucus secretion of small intestine.

5- IGE:

The serum level of is 10-130 microorganisms per 100 ml. half - life is 2- 3 days it con citrat ed in concentrated responsible from immediate allergic anaphylactic reactions.

2-4-3 Vaccination Site:

It is necessary because vaccine failure may occur due to failure to store and transport under strict temperature controls.

Among the vaccines, polio vaccines is the most sensitive to sheet requiring storage at minus 20 degree C, vaccines which may be stored in the freezer compartment are: Polio, Measles. Vaccines which must be stored in the cold part but never allowed to freeze are: DPT, Tetanus toxoid, D T, B C G and Diluents. (Park k., et al, 2007)

2-5 Cold Chain:

It is a system of storage and transport of vaccine at low temperature.

2-5-1 The Cold Chain Equipment in Cold of the Following:

a. Walk in cold room (wick): they are located at the regional levels meant to store vaccines up to (3 months) and serve (4-5) districts. (Ropert N., et al, 2002)

b. Deep freezer (300 I tr) and ice lined refrigerators (1LR – 300, 2400 liter capacity) supplied to all districts and the (wick) locations to store vaccines.
Deep freezers are used for making ice locks and to store (opv) and measles vaccines.

a. Cold boxes are supplied to all peripheral centers. These are used mainly for transportation of vaccines.

b. Vaccine carrier is used to carry small quantities of vaccines (Ropert N., et al, 2002).

c. Day carrier, are used to carry small quantities of vaccines.

d. Ice pack, in some countries half of the babies born alive die before they are (5 years old), these deaths are often due to six deadly Diseases: Measles, Diphtheria, Poliomyelitis, Tetanus, Whooping cough and Tuberculosis. All of these diseases can be prevented by immunization.

2-6 Measles:

Acute highly infectious disease of childhood caused by a specific virus of group myxoviruses (levene p., et al, 2000).

Characterized by:

a. Fever.

b. Catarrhal symptoms of respiratory tract.

c. Typical rash.

Mode of transmission:

Directly from one person to anther mainly by droplet infection and nuclei:

Incubation period:

It is commonly (10) days from exposure to onset of fever and (14 days) appearance of rash.

Clinical features:

- There are three stages.

1- Pre dermal stage:

- 10 days after infection characterized by:

  a. Fever.

  b. Craze with sneezing nasal discharge.

  c. Cough.

  d. Redness of eyes.

  e. Laceration.
f. Photophobia.

There may be diarrhea or vomiting.

2- Eruptive phase:

Characterize by typical – dusky – red macular or macula popular rash. Diagnoses of measles are based on the typical rash kellicks spots. (Levene p., et al, 2000)

Measles reactions:

- Fever rash (5-10 days) after immunization.
- There is no spread if virus from the vaccines to contact.
- adverse reaction toxic shock syndrome occurs when vaccine is contaminated or the same virus is used for more than on session on the same day or next day, so vaccine should not use after (4 hours) of opening the vial.

Control measles:

1. Isolation for (7 days) after onset of rash.
2. Immunization of contact within two days of exposure.
3. Promote immunization at the beginning of an epidemic essential to limit the spread.

2-7 Diphtheria:


Incubation period:

- (2-6 days) occasionally longer.

Clinical features:

1. Sore throat.
2. Difficulty in swelling.
3. Low fever.
4. Erythematic.
5. Localized exudates.

DPT vaccine:

DPT and DT vaccines should not be frozen then should be stored in refrigerators between (4).
a. Optimum age, week after birth.
b. Number of doses, (3 doses) each dose (0.05 ml).
c. Interval between doses: (4 week) between the 3 doses with a booster injection at one and half year to 2 years followed by another booster (DT only) at the age of (5-6 years).

Reaction:

- Fever.
- Mild local reaction.

1- Control of diphtheria:
   1. Case and carriers.
   2. Early detection.
   3. Isolation.

2- contacts:

   a. None immunized close should receive prophylactic penicillin or erythromycin.
   b. Where primary immunization or booster dose was received previous (2 years) no further action would be needed.

2-8 Whooping Cough:

It is an acute infectious disease usually of young children caused by B pertussis. Characterized by mild fever and irritating cough gradually becoming small paroxysmal. (Ropert N., et al, 2002).

Mode of transmission:

1- Droplet infection.
2- Direct contact.

Incubation period:

Usually 7.14 days put not more than 3 weeks pertussis vaccine. Vaccine given in 3 doses with intervals 6-8 weeks at week's age two booster at 3 year doses.

5 ml intra muscular
Reaction:

1- Mild fever.
2- Local reaction at the site of injection.

I- Control of whooping cough:

1- Cases.
2- Early diagnosis.
3- Isolation of cases.
4- Treatment of cases.

2- contact:

a- infant and young children should be kept away from cases.

b- Those known to have been in contact with whooping cough may be given prophylactic antibiotic.

**2-9 Polio Mellitus:**

Is an acute viral infection causes by RNA. It is primarily an infection of the human (Ropert N., et al, 2002) alimentary tract. But the virus may affect the following

- Central nervous system in a very small percentage (about 10/0) of cases resulting in varying digresses of paralysis, and possible death clinical spectrum.

1. In apparent infection sub clinical infection.
2. Abortive polio minor illness.
3. Non paralytics' polio.
4. Paralytics' polio.

Incubation period:

7-14 days (range 3+0= 35 days

Mode of transmission

1- Orofecal route.
2- Droplet infection.

Doses:
3 drops: 1st at 6 weeks at one month interval

Prevention of militias:

Immunization is sole effective means of preventing poliomyelitis.

**2-10 Tetanus:**

An acute disease causative agent is clostridium tetanus. (Ropert N., et al, 2002)

Characterized by:

1- Muscular.

2- Spasm of voluntary muscle.

Incubation period:

7-14 days (range 3 to 35 days).

Mode of transmission:

Usually 6-10 days, it may be short as one day or long as several months.

Type of tetanus:

1- Traumatic.

2- Puerperal.

3- Autogenic.

4- Idiopathic.

5- Tetanus neonatal.

Prevention:

Tetanus is best prevented by active immunization tetanus vaccine is offered routinely to infant in combination with diphtheria vaccine and killed B. pertussis organism as DPT vaccine, according to national immunization schedule.

Doses:

Doses of DPT with interval 4-8 weeks started at 6 weeks of age followed by booster dose at 18 months of age and second booster (only DT) at 5-6 years of age and third only (TT) after years of age. (Ropert N., et al, 2002)
2-11 Tuberculosis:

Types of tuberculosis:

1- Extra thoracic tuberculosis.

It is a tuberculosis infection of the tonsils and cervical lymph nodes. Tuberculosis glands in the neck are usually the result of tuberculosis infection.

The tonsil, first cervical lymph nodes are discrete, firm and freely mobile and may be liquefy and rupture into the skin forming chronic sinuses. (Levene P., et al, 2000).

1- Abdominal tuberculosis:

This includes tubes m sent Erica, tuberculosis enteritis and tuberculosis peritonitis.

Made of infection:

- Ingestion of T.B bacilli (bovine or human) or swallowing sputum. Containing the organism from tuberculosis lesion in the lung.

Tubes mesenteric:

Mesenteric glands in the right iliac fosse are affected first. the glands enlarge, become rent to intestinal loops, they heal by fibrosis and calcification or liquefy and discharge there lion then in the peritoneum or to spread by blood leading to tuber Coloma or military T.B.

Clinical picture:

General symptoms of T.B abdominal pain failure to thrive mild attack of diarrhea alternating with constipation, passage of fatty stools due to obstruction of lacteal. Presence of palpable gland in the abdomen (multiple, firm, slightly mobile and slightly tender).

2- Tuberculosis enteritis:

T.B ulcers fevers patches of terminal ileum or in the scum. The ulcers spread infection a circular infection following the line of lymphatic.

Clinical picture:

Persistent diarrhea with loose, slightly offensive stools may contain blood and mucus. On examination = severe emaciation, and tender abdomen.

3- Tuberculosis peritonitis:
It may be:
- Direct penetration of T.B bacilli from the gut or direct spread from T.B ulcer.
- Direct extension from serious T.B lymph node.
- Via blood stream.

I- Ascetic T.B peritonitis:
- Progressive enlargement of the abdomen evidences of ascetic clinically (full flanks and shifting dullness).
- Aspiration of fluid reveals clear fluid which is straw colored and has a lymphatic cell reaction.

II- Plastics (T.B peritonitis):
- The intestinal loops become matted together.
An abscess may be formed in between intestinal loops and may ulcerate through skin.
- General symptoms of T.B infection.
- Swollen abdomen. The mentum may be felt as a sausage shaped mass across the epigastria wall.

Diagnosis of tuberculosis:
1- history: history of control with an adult with open T.B.
2- Physical examination:
Neural toxemic manifestation as loss of body weight, anorexics, easy fatigue ability signs of obstructive, collapse, consolidation effusion depending on the under lying pathology T.B. must be put in of any sheet condition.
3- investigation:
A. tuberculin test:
It is on allergy skin test, to detect the hypersensitivity to the tubercular protein.
The T.B bacilli it depend on the proper function of lymphocytes (i.e. delayed hyper sensitivity).

Technique:
In typical mal injection of 0.1 ml of purified protein derivative (PPD) containing 5 tuberculin. Units into cleaned skin of the flexor or extensor surface of the forearm. The injection is made with a short sharply beveled needle with special tuberculin syringe a pale elevation of the skin 6-10 mm in diameter should be produced.

**Interpretation:**

The test is read after 48-72 hours.

- A 10MM or more in duration = positive reaction.
- 5-9 mm duration = doubt full reaction, should be repeated.
- 0-4 in duration = negative reaction.

A positive tuberculin reaction indicates that the person has been infected with T.B bacilli and is hyper sensitive to the tubercular protein. However it does mean an active lesion unless the child is below 5 years of age or had recent conversion.

**Causes of false negative tuberculin test:**

- If the test is during the incubation period before the development hyper sensitivity.
- Advanced TB e.g. Billiard T.B or meaning it is.
- Severe malnutrition.
- Acute viral infections as meals rubella mumps.
- Cortices steroid administration.
- Vaccination with live attenuated vaccines e.g. measles vaccine.
- Malignancy as lymphoma or use of cyst toxic drugs.

**Causes of false positive tuberculin test:**

- Infection with atypical mycobacterium which are not common in Egypt. (Park k., et al, 207).

**B-x-ray examination:**

The findings depend on the lesion e.g. military T.B enlarged mediastina lymph nodes pleural effusion (Park k., et al, 207).

**C-isolation of TB bacilli:**
Either from gastric lavage sputum pleural effusion or aspirated bronchial secretion obtained by – fiber optic – bronchoscope – this is done by direct smear stained with zeal nelson stain culture and guinea pig inoculation the organism is cultured by liven stein – Jensen medium or recently by BACTER radio metric ,system which need shorter duration (7-10 day) . D- in T.B meningitis. (Park k., et al, 207)

CSF analysis:

The fluid is turbid with the so called ground glass appearance. The pressure is increased. the cells increase in number with predominance of lymphocytes the protein increase while glucose decreases an standing the CSF form fibrous web in which the T.B bacilli can be demonstrated by direct examination using zeal nelson stain are by culture or guinea pig in occultation .( park k., et al, 207)

E. Elisa for diagnosis of T.B antigens in CSF, serum or cultures.

F. poly mares chain (PCR) for detection of M. Tuberculosis

G. Biochemical mark by gas chromatography to detect structural of component of T.B bacilli.

Treatment:

a. Preventive treatment:

b. Preventive of T.B depends on:

1- Preventing contact with patient having active disease.

2- administration of BCG , BCG vaccination is recommended as public health measure in developing countries with high prevalence of tuberculosis some studies have not demonstrated the protective effect of the vaccine possibly because of varying vaccine potency, improper preparation storage or administration poor nutritional status interference with infection with tuberculosis mycobacterium (Revise BCG vaccine) .

3- INH chemo prophylaxis (immunotherapy of T.B)

This is indicated in:

- all contacts below 5 years who have negative tuberculin test should receive INH for 3 months followed by vaccination .
- all contacts below 5 years who have positive tuberculin test and were not dived BCG should have an X-ray chest and receive INH for 9 month. (park k., et al, 2007)

2- Treatment of the case:

A. general:
- Bed rest till the condition improves.
- Adequate diet. (Park k., et al, 2007)

B. specific:
- Drug regimens in the treatment of tuberculosis

1- Pulmonary T.B
A. 9 month course:
- INH + Rifampicin daily for 9 month or – INH + Rifampicin daily for 2 month then INH (in double dose 1-E 20-30 mg 1kg )+ Rifampicin (in usual dose) twice weekly for 7 month . (Park k., et al, 2007)

B. 6 month course:
- Pyrazinamide + INH +Rifampicin daily for 2 month. Then INH and Rifampicin daily for 4 month (or INH in double dose + Rifampicin) twice weekly for 4 month
Streptomycin +INH+Rifampicin + pyrazinamide daily the first 2 month, then INH +Rifampicin daily (or twice weakly – mentioned before) for the remaining month.

Anti-tuber closes drugs in children. (Park k., et al, 2007)

- Indication of cortices steroids in treatment of T.B:
  a. T.B meaning it is: to reduce vacuities, inflammation and intracranial pressure.
  b. Endo bronchial T.B.
  C. pericardial effusion to prevent constrictive pericarditis.
  d. T.B pleural effusion.


Prednisone is given 2MG 1KG 1day in 2 divided doses for 4-3 weeks then gradually tapering.

Anti-tuber closes drugs in children 1-1 ionized (TNH) (Bacterial).

Dose = 10-15 Mg 1 kg day (maximum 300).
Side effects:

Two principal toxic effects which are rare in children:

A. peripheral neuritis (due to competitive in habitation of pyridoxma utilization).
B. tepato to toxicity 3-10 of children may experience than transient rise of transaminases but clinic ally significant help ototoxicity is very rare : ( park k., et al, 2007)

2- Rifampicin (Bactericide)
Dose = 10-20 Mg 1kg 1 days (maximum = 300 mg)

Side effects:
- Orange discoloration of urine and tears.
- GIT disturbances.
- Hepatic toxicity (as symptomatic rise of Tran's minuses)

3- Pyrazinamide (bactericide for bacilli inside macrophages)
Dose: 20-40 mg 1 kg 1 days (maximum = 29) ( park k., et al, 2007).

Side effects:
- increase serum uric acid (but manifestations of hyper uric acid).
- Hyper sensitivity reactions (rare).

4. Streptomycin (bactericidal for extra cellular bacilli).

Does:
20-40 mg 1kg 1days (maximum: 1 g).
It is major use is when INH resistance is suspected or when the child has alive threating from of T.B.

Side effects:
The main is to vestibular and auditory cranial nerve.
Nephrite toxicity is much less frequent. (Park k., et al, 2007).

New types of vaccine:

**2-12 Rotavirus Vaccine (RV):**

Minimum age: 6 weeks
2 or 3 doses administered orally
If Rotarix is used, administer a 2-dose series at age 2 and 4 months

If RotaTeq is used, administer a 3-dose series at age 2, 4, and 6 months

If any dose in the series was RotaTeq or vaccine product is unknown for any dose in the series, a total of 3 doses of RV vaccine should be administered (jamal M., et al, 2003).

**Table (2-1):** Schedule of vaccinations currently applied by the ministry of health in Egypt

<table>
<thead>
<tr>
<th>Age</th>
<th>Name of vaccine</th>
<th>Type</th>
<th>Dose and rout of administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth – 1 month</td>
<td>BCG</td>
<td>Live attenuated bovine strain</td>
<td>0.1 ml intradermal at the insertion of left deltoid</td>
</tr>
<tr>
<td>2nd month</td>
<td>Oralpolio vaccine + DPT</td>
<td>Live attenuated (SABIN) D&amp;T (Toxoid) p (killed)</td>
<td>2 drops orally 0.5 ml I'm injection</td>
</tr>
<tr>
<td></td>
<td>Hepatitis B vaccine</td>
<td>HBsAg produced by yeast cells using DNA recombinant technique</td>
<td>0.5 ml IM</td>
</tr>
<tr>
<td>4th month</td>
<td>The same as the second month + dose of salk vaccine 0.5 ml. M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th month</td>
<td>The same as the second month + a second dose of salk vaccine 0.5 ml .M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9th month</td>
<td>Measles + Oral polio vaccine</td>
<td>Live attenuated</td>
<td>0.5 ml subcutaneously</td>
</tr>
<tr>
<td>1.5 year</td>
<td>Oral polio +DPT</td>
<td>Booster dose</td>
<td></td>
</tr>
<tr>
<td>6 years</td>
<td>Oral polio +DPT +BCG</td>
<td>Booster dose</td>
<td></td>
</tr>
<tr>
<td>9 years</td>
<td>Oral polio vaccine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 years</td>
<td>Oral polio vaccine + DT + MMR (if not given at 6 y)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Delayed immunization:

If infant or children were not vaccinated in the proper time e.g. due to family neglect, ignorance or previous diseases, the following schedules are used:

1- Infants less than 14 month – 7 years of age:
- The first visit: DPT + Polio + tuberculin test.

- one month later: MMR

- Another 1 month later DPT + polio

- Another 2 month later: DPT + polio

- After 1 year: Booster dose of polio + DPT if less than 5 years.

- Children above 7 years.

- The first visit + DT + polo vaccines.

- one month later: MMR.

- After another 1 month DPT + polio.


Complications of vaccines:

BCG: persistent ulcer at the side of vaccination supportive lymphadenitis and cold abscess with T.B sinus Generalized BCG infection.

DPT: Mild = fever, local pain

Moderate: protracted cry

Sever: febrile convulsions, encephalopathy

Polio: paralysis in immune deficient


Other vaccines :( not included in the compulsory schedule of Egypt)

1. Meningococcal vaccine: 5cc subcutaneously gives protection for 2 year against meningococcal and it is used in epidemics.

2. Pneumococcal vaccine: used in splenectomized patients and in sickle cell anemia.

3. Homophiles influenza type B: it is recommended in 2nd 4th 6th and 12 months of age.
4. Typhoid and para typhoid vaccine (T A B) vaccine.
5. Rabies vaccine.
7. Cholera vaccine.
8. Hepatitis A vaccine.

**Table (2-2): National immunization schedule for children**

<table>
<thead>
<tr>
<th>(a) for infant</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>At birth</td>
<td>BCG and opv-o dose</td>
</tr>
<tr>
<td>At 6 weeks</td>
<td>B CG (if not given at birth)</td>
</tr>
<tr>
<td>At 10 weeks</td>
<td>DPT – 1, OPV -1 and hepatitis B-1</td>
</tr>
<tr>
<td>At 14 weeks</td>
<td>Dpt -2, opv -2 and hepatitis</td>
</tr>
<tr>
<td></td>
<td>Dpt -3, opv-3 and hepatitis -3</td>
</tr>
<tr>
<td>At 9 month</td>
<td>Measles</td>
</tr>
<tr>
<td>(b) at 6-24 month</td>
<td>Dpt and opv</td>
</tr>
<tr>
<td>© at 5-6 years</td>
<td>Dt – the second dose of DT should interval of one month if there is not documented evidence of previous e DPT</td>
</tr>
<tr>
<td>(d) at 10-16 years</td>
<td>Tetanus toxoid – the second dose should be given at antinterved or documented previous immunization vaccines</td>
</tr>
</tbody>
</table>

**2-13 Previous Studies:**

2-13-1 A study was conducted at a kindergarten in Casino and Crotone, Italy. March – 2007 to evaluated knowledge of mothers regarding immunization of their children. A sample size of 841 mothers who attended public kindergarten in Casino and Crotone were selected for the purpose of the study. The results showed that Found (67.8%) of the eligible children mothers who were participated in the study with
mean age of 33 years (range 22 – 49 years) almost all were married, and two thirds of the sample had attained a middle or higher school educational level. Mothers knew most of main mandatory vaccination since a large proportion of respondents rightly believed that vaccinations for hepatitis (87.5%), poliomyelitis (79.9%), tetanus (74.4%), and diphtheria (66.3%) were required for all infant. However there were some misconception about which vaccinations were mandatory and respondents early over estimated requirement for their children. Our result indicate that lack of knowledge prevent Italian mothers from playing an effective Role in eradication of vaccine for infant. Of even greater concerns that only 202 (24%) know that MMP and rubella were diseases that are vaccine preventable in children and the level of knowledge about mandatory vaccination correlated significantly with mothers age and level of education. Vaccination coverage in Italy has recently improved.

2-13-2 Across – sectional study was carried out by (Yousif M. A., et al, 2013) during the period of one month in April 2013 in Taif Saudi Arabia with the objective of assess mother knowledge and attitude on child hood immunization among Saudi mothers. Data was collected by trained pharmacy students from parents in public places in the town. Some students also recruited some of their eligible relatives... A sample size consisted of 731 mothers were adopted. The results revealed that (91.9%) of the study sample knew the role of routine vaccination in protecting children from some in infectious diseases and theirs complication and (86.9%) mothers knew the timing of routine vaccination schedule (41.6%) knew that administration of multiple doses of the same vaccine is important for child immunity. In conclusion the results of the present survey showed that mother has good knowledge and positive attitude in some aspects related to child immunization. And educational interventions are needed to upgrade mothers knowledge with special emphasis on less educate and residents of rural areas.

2-13-3 In Sudan there is study carried out by (Alwaleed Omar, et al, 2012) to assess the knowledge and attitudes of mothers of children less than 2 years age in regard to Routine immunization in Khartoum state – Sudan during 2012. A sample of 800 mothers was selected. The study results showed that there was good knowledge among the mothers (95.1); the main source of this knowledge was the health workers (57.5%) then T.V (14%) and Radio (2%). The majority of mothers had favorable attitude towards immunization. (95.5%) of them agree with importance of
immunization (95.5%) agreed this immunization is not harmful while (22.5%) agreed to immunization for a sick child, husband encouragement for immunization (98.1%). Most of children in the study group had fully completed their immunization against the vaccine preventable diseases (87%), main reasons of missing vaccination were busy (27%) sickness (80%), (90.5%) of immunized children with immunization cards, this study suggested that health education interventions may be more effective if these intervention focus on raising the community awareness and train health workers to deliver proper message concentrate on importance of immunization, knowledge of immunization schedule and side effect after immunization.
Chapter Three

Materials and Methods
3- Materials and Methods

3-1 Study Design:
A descriptive hospital based study was conducted aimed at assessing mothers’ knowledge regarding immunization of children in the first year after birth at barber health center, River Nile state, Sudan 2017

3-2 Study Setting:
The study was conducted at Barber Health Center, barber town, River Nile state, Sudan. Barber is a Sudanese town lies in River Nile state in North of Sudan. It is located at about 311 km North of Khartoum the capital of the country. Its climate is a desert which is characterized by dry and cool temperature in winter and hot weather with scares rainfall during summer. The residents of the town depend on agricultural, industrial and commercial activities to earn their life.

The Health Center was established on 11/11/1987 and receives children from all villages around it (Hoshaldar, Alhagana Aldica, Mbirika, Alfirkha, Alhbala...etc.). There are 2 rooms (first room is used for immunization and second one for measuring weight and length of children). Barber health center, barber city, Nile River state, Sudan.

3-3 Study Population:
All mothers with children in the first year age at barber health center, Nile river state, Sudan 2017.

3-3-1 Inclusion Criteria:
All mothers with children in the first year of age and have already immunized them in barber health center were included in the study sample.

3-3-2 Exclusion Criteria:
- All mothers with children of more than year of age.
- All mothers who did not immunize their children at barber health center.
- All mothers who were not available at the time of the study.

All the above mention mothers were excluded from the study sample

3-4 Sample Size:
The study sample included all mothers (210) who immunized their children at Barber health center during the study period from February 2016 to February 2017.
3-5 Ethical Considerations:

- An official letter was obtained from Gezira University requesting approval of Barber Health Center's authorities to allow the researcher to conduct his study at it center.
- Then the approval was obtained from the center's managements.
- The researcher explained for the participant mothers the contents of the questionnaire and assured them that their participation will be confidential and voluntary. Then all mothers gave a verbal consent and expressed their willingness and readiness to fill the questionnaire from which will not take more than 10 minutes to be completed.
- Interviewers' questionnaire forms were filled in their rest time.

3-6 Data Collection Tool:

Data was collected through questionnaire forms designed for the purpose of this study. Each questionnaire is divided into two parts; the first part includes questions about the basic bio data such as mother residence, age, level of education, occupation and others. The second part includes questions about mothers' knowledge regarding children immunization, definition, side effect of vaccine, complications ……etc.

3-7 Data Analysis:

For the purposes of this study data was tabulated, coded, entered in computer and then analyze by using Statistical Package for Social Sciences (SPSS) program, version 16. Then the results in forms of percentages, frequency distribution were presented in tables and figures.

Table (3-1): Mothers' knowledge assessment scale

<table>
<thead>
<tr>
<th>Level of knowledge</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inacceptable</td>
<td>Less than 30%</td>
</tr>
<tr>
<td>Poor</td>
<td>35-55 %</td>
</tr>
<tr>
<td>Fair</td>
<td>56-65 %</td>
</tr>
<tr>
<td>Good</td>
<td>66-75 %</td>
</tr>
<tr>
<td>Excellent</td>
<td>Above 75 %</td>
</tr>
</tbody>
</table>
Chapter Four
Results and Discussion
4- Results and Discussion

4-1 Results:

**Table (4-1):** Distribution of study sample according to age

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30</td>
<td>60</td>
<td>28.3</td>
</tr>
<tr>
<td>31-40</td>
<td>109</td>
<td>52</td>
</tr>
<tr>
<td>41-50</td>
<td>35</td>
<td>16.7</td>
</tr>
<tr>
<td>&gt; 50</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table (4-1) illustrates that 52% of mothers were in the age group ranging from 31 to 40 years old.

**Table (4-2):** Distribution of the study sample according to their level of education

<table>
<thead>
<tr>
<th>Education level</th>
<th>Percent</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiterate</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Primary</td>
<td>64</td>
<td>30</td>
</tr>
<tr>
<td>Secondary</td>
<td>43</td>
<td>20</td>
</tr>
<tr>
<td>B.Sc.</td>
<td>74</td>
<td>35</td>
</tr>
<tr>
<td>M.Sc.</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table (4-2) illustrates that 45% of the study sample were either B.Sc. or MSc holders.
**Table (4-3):** distribution of the study sample according to source of information  

(n = 210)

<table>
<thead>
<tr>
<th>Source</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>29</td>
<td>13.6</td>
</tr>
<tr>
<td>Radio</td>
<td>71</td>
<td>34</td>
</tr>
<tr>
<td>Television</td>
<td>110</td>
<td>52.4</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Grand total</strong></td>
<td><strong>210</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table (4-3) shows 52% of the study sample got information from T.V, while 34% of them mentioned radio as source of information, 13.6% of them got information from the community and others.

**Table (4-4):** Distribution of study sample according to their occupation  

(n = 210)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Percent</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>House wife</td>
<td>80</td>
<td>38.1</td>
</tr>
<tr>
<td>Laborer</td>
<td>41</td>
<td>19.5</td>
</tr>
<tr>
<td>Employee</td>
<td>65</td>
<td>31</td>
</tr>
<tr>
<td>Others</td>
<td>24</td>
<td>11.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table (4-4) shows that 38.1% of the study samples were house wives.
Table (4-5): Distribution of study sample according to income status

<table>
<thead>
<tr>
<th>Income\Pound</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG 1,000 and above</td>
<td>76</td>
<td>36.2</td>
</tr>
<tr>
<td>SDG 500-1000</td>
<td>90</td>
<td>42.9</td>
</tr>
<tr>
<td>SDG 500 and less</td>
<td>44</td>
<td>21.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>210</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table (4-5) shows that 63.9% their incomes did not exceed 1000 SDG.

Table (4-6): Distribution of study sample according to immunization status of their children

<table>
<thead>
<tr>
<th>Immunization status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete</td>
<td>162</td>
<td>77.1</td>
</tr>
<tr>
<td>Partial</td>
<td>30</td>
<td>14.3</td>
</tr>
<tr>
<td>Non immunized</td>
<td>18</td>
<td>8.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>210</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table (4-6) shows 77.1% of the study sample completed vaccination of their children, whereas only 8.6 of them did not vaccinate their children.
**Table (4-7):** Distribution of study sample according to reasons behind missed opportunity of vaccination of children (n = 210)

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sickness</td>
<td>12</td>
<td>5.7</td>
</tr>
<tr>
<td>Travelling</td>
<td>7</td>
<td>3.3</td>
</tr>
<tr>
<td>Complication of immunization</td>
<td>10</td>
<td>4.8</td>
</tr>
<tr>
<td>Vaccine not available</td>
<td>1</td>
<td>.5</td>
</tr>
<tr>
<td>Sub-total</td>
<td>30</td>
<td>14.3</td>
</tr>
<tr>
<td>Missing system</td>
<td>180</td>
<td>85.7</td>
</tr>
<tr>
<td><strong>Grand total</strong></td>
<td><strong>210</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table (4-7) shows that 85.7% of the respondent mothers did not catch up with the planned vaccination schedule which was announced by the center authority.

**Table (4-8):** Distribution of the study sample according to their knowledge about definition, types and goals of immunization process (n = 210)

<table>
<thead>
<tr>
<th>Mothers knowledge</th>
<th>Correct</th>
<th>Incorrect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Number</td>
<td>Number</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Definition of immunization</td>
<td>160</td>
<td>50</td>
<td>210</td>
</tr>
<tr>
<td></td>
<td>76</td>
<td>24</td>
<td>100</td>
</tr>
<tr>
<td>Types of immunization</td>
<td>57</td>
<td>153</td>
<td>210</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>73</td>
<td>100</td>
</tr>
<tr>
<td>The goals of immunization process</td>
<td>200</td>
<td>10</td>
<td>210</td>
</tr>
<tr>
<td></td>
<td>95.2</td>
<td>4.8</td>
<td>100</td>
</tr>
<tr>
<td>Mean knowledge</td>
<td>66.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (4-8) shows that (76%) of the study sample responded with correct answers regarding definition of immunization, and 27% of them responded correctly with regard to
types of immunization. 95.2% of the study sample responded with complete correct answers regarding goals of immunization. Therefore, their mean knowledge was 66.1%.

**Table (4-9):** Distribution of the study sample according to their knowledge about side effects and complications of immunization

<table>
<thead>
<tr>
<th>Mothers knowledge</th>
<th>Correct answers</th>
<th>In correct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO %</td>
<td>NO %</td>
<td>NO %</td>
</tr>
<tr>
<td>Side effect of immunization</td>
<td>190 90.5</td>
<td>20 9.5</td>
<td>210 100</td>
</tr>
<tr>
<td>Complications of immunization</td>
<td>147 70</td>
<td>63 30</td>
<td>210 100</td>
</tr>
</tbody>
</table>

Table (4-9) reveals that (90.5%) of the study sample responded with correct answer regarding side effects of immunization, while (70%) of the study sample responded with correct answers about complications of immunization.

**Table (4-10):** Distribution of study sample according to their knowledge about timing of routine immunization and how to deal with side effects

<table>
<thead>
<tr>
<th>Mothers knowledge</th>
<th>Correct complete answers</th>
<th>In correct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO %</td>
<td>NO %</td>
<td>NO %</td>
</tr>
<tr>
<td>Timing of routine immunization</td>
<td>200 95.3</td>
<td>10 4.7</td>
<td>210 100</td>
</tr>
<tr>
<td>How to deal with side effect of immunization</td>
<td>195 92.7</td>
<td>15 7.3</td>
<td>210 100</td>
</tr>
</tbody>
</table>

Table (4-10) shows (95.3%) of the study sample responded with correct complete answers regarding time or period of routine immunization, and (92.7%) of them responded with correct complete answers regarding dealing with side effects.
Table (4-11): Distribution of study sample according to preference of immunization and availability of cards of immunization

(n = 210)

<table>
<thead>
<tr>
<th>Mothers knowledge</th>
<th>Correct complete answers</th>
<th>In correct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO</td>
<td>%</td>
<td>NO</td>
</tr>
<tr>
<td>Prefer immunization process</td>
<td>200</td>
<td>95.3</td>
<td>10</td>
</tr>
<tr>
<td>Availability of card</td>
<td>205</td>
<td>97.6</td>
<td>5</td>
</tr>
</tbody>
</table>

Table (4-11) show that (95.3%) of the study sample responded with correct complete answers regarding mothers preference of immunization process, and (97.6%) of them regarding availability of card.
Table (4-12): Distribution of study sample according to their knowledge regarding measles, Diphtheria, tetanus, poliomyelitis, whooping cough and tuberculosis.

(n = 210)

<table>
<thead>
<tr>
<th>Mothers knowledge</th>
<th>Correct complete answers</th>
<th>In correct</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO</td>
<td>%</td>
<td>NO</td>
</tr>
<tr>
<td>Definition of measles, signs, symptoms and complication</td>
<td>165</td>
<td>78.6</td>
<td>45</td>
</tr>
<tr>
<td>Definition of diphtheria, signs, symptoms and complication</td>
<td>154</td>
<td>73.3</td>
<td>56</td>
</tr>
<tr>
<td>Definition of Rotavirus Definition, signs, symptoms and complication</td>
<td>100</td>
<td>47.6</td>
<td>110</td>
</tr>
<tr>
<td>Definition of poliomyelitis, signs, symptoms and complication</td>
<td>150</td>
<td>71.4</td>
<td>60</td>
</tr>
<tr>
<td>Definition of whooping cough, signs, symptoms</td>
<td>147</td>
<td>70</td>
<td>63</td>
</tr>
<tr>
<td>Definition of tuberculosis, signs, symptoms and complication</td>
<td>160</td>
<td>76.1</td>
<td>50</td>
</tr>
<tr>
<td>Mean knowledge</td>
<td></td>
<td>69.5</td>
<td></td>
</tr>
</tbody>
</table>

Table (4-12) shows that (78.6%) of the study sample responded with correct complete answers regarding definition, signs and symptoms and complication of measles. The average knowledge of the study sample regarding definition, signs, symptoms and complications of diphtheria, Rotavirus, poliomyelitis, whooping cough and tuberculosis is good as they scored 69.5%.
4-2 Discussions:

Immunization is defined as an effort to prevent or modify natural infection by administration of antigen or antibody. Vaccines action is used to prevent specific infectious diseases. Mothers who are essential members on immunization process because first person responsible from children and frequently contact and spend a long time.

The results of this study showed that two thirds (65%) of the mothers had either secondary, B.Sc. or M.Sc. degrees. This is in disagreement with what had been reported by (Parinto, 2007) whereas; two thirds of study sample had attained a middle or higher school educational level. According to this study 52.1% of the mothers were within age group 31-40 years. Again this result is not similar to the result obtained by (Parinto, 2007) where mothers who participated in his study with mean age of 33 years.

The results of this study revealed that 63.9% of the study sample their income did not exceed SDG l000 and 36.2% their incomes were above SDG l000 per month. Table (4.4) showed that 38.1% of the study sample was housewives, while 31. % of them were employees and 19.5% laborer and 11.4. % others (free job).

As shown in table (4.6) 77.1% of the mothers completed vaccination of their children. This result is also in disagreement with what had been reported by (Alwaleed O., et al, 2012) where (87%) of mothers in the study group had fully completed immunization of their children against the vaccine preventable diseases.

Table (4.3) shows 52% of the study sample had got information from T.V, while 34% of them mentioned radio as source of information, 13.6% of them got information from the community and other. This result is slightly different that the results stated in the study conducted by (Alwaleed O., et al, 2012) where the main sources of knowledge for mothers were the health workers (57.5%) then T.V (14%) and Radio (2%).

Table (4.7) revealed that the main reasons of missing vaccination were missing of planned vaccination schedule (85.7%) followed by sickness (5.7%) which is not similar to what had been illustrated by (Alwaleed O., et al, 2012) where the main reasons of missing vaccination were busy mothers (27%) and sickness (80%).

As displayed in table (4-8), (76%) of the study sample responded with correct answers regarding definition of immunization, and 27% of them responded correctly with regard to types of immunization. Table (4-8) also revealed that (95.2%) of the mothers responded
with correct answers regarding goals of immunization. This is in an agreement with the results of the study conducted by (Alwaleed O., et al, 2012) where (95.5%) of mothers agree with objective of immunization and also agrees with the results reported by (Yousif M. A., et al, 2013) where (91.5%) of mothers knew the role of routine vaccination in protecting children from some infectious diseases and theirs complication.

Table (4.9) reveals that (91.9%) of the study sample responded with correct answer regarding side effects of immunization, while (70%) of the study sample responded with correct answers about complications of immunization.

Table (4.10) shows (95.3%) of the study sample responded with correct complete answers regarding time or period of routine immunization. This is nearly similar to what has been stated by (Yousif M. A., et al, 2013) where (86.9%) mothers knew the timing of routine vaccination schedule).

Table (4.11) showed that (97.6%) of the mothers responded with correct answers regarding availability of immunization cards. this similar to what had been stated by (Alwaleed O., et al, 2012) where (90.5%) of immunized children with immunization cards,

Table (4.12) shows that the average knowledge of the study sample regarding definition, signs, symptoms and complications of measles, diphtheria, Rotavirus, poliomyelitis, whooping cough and tuberculosis scored (69.5%) which is considered good knowledge as measured against the knowledge assessment scale illustrated in table (3-1). This results is in an agreement with the result of the study conducted by (Yousif M. A., et al, 2013) where it In concluded that mothers had good knowledge and positive attitude in some aspects related to child immunization. It is also similar to the study results of (Alwaleed O., et al, 2012) where there was good knowledge among the respondent mothers.

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Chapter Five
Conclusion and Recommendations
5- Conclusion and Recommendations

5-1 Conclusion:

The results of this study showed that the average knowledge of the respondent mothers regarding definition, type and goal of immunization was 66.1%, with regard to side effect and how to deal with side effect of immunization it was 91.6%. Regarding timing of immunization the mothers had scored 95.7% as average knowledge. As for mothers' preference of immunization for their children they scored 95.3%, and 97.6% of mothers mentioned availability of cards. The mothers' average knowledge regarding definition, signs, symptoms and complications of measles, diphtheria, rotavirus, poliomyelitis, whooping cough and tuberculosis was found to be (69.5%). the overall main knowledge of mothers was (70.7%) which is considered good knowledge as measured against the knowledge assessment scale illustrated in table (3-1)

5-2 Recommendations:

Based on the conclusion of this study the researcher recommended the following:

- Enhance health education to be more effective and focus on raising the community awareness.
- Train health workers to deliver proper message concentrate on importance of immunization routine.
- Improve social mobilization regarding importance of immunization in collaborating with community health agents, local religious leaders, and women group representatives, UN agents, NGOs... etc., as well as using mass media to increase out reach.
- Pre married counseling.
References


14. US Centers for Disease Control and Prevention. Website (Clinical Immunization Safety Assessment Network section)


Appendix

Questionnaire about mothers' knowledge and practice regarding immunization of children one year

At barber health center

River Nile state Sudan 2017

1. Residence:

2. Age:
   20-24 ( )  25-30 ( )  31-35 ( )  36-40 ( )  41> ( )

3. Level of education
   Illiterate ( )  basic ( )  secondary ( )
   Bachelor ( )  others ( )

4. Occupation:
   House wife ( )  labor ( )  employee ( )  others ( )

5. Level of the family income:
   > 1000 $DG ( )  500-1000 $DG ( )  < 500$DG ( )

6. You think about child immunization?
   YES ( )  No ( )

7. If the responded via yes what the source of that?
   TV ( )  Radio ( )  relative ( )  others ( )

8. Immunization children?
   Yes ( )  No ( )

9. If the responded via no please explain causes?
   Mothers knowledge deficient about immunization ( )
   Not availability to near health center ( )
   Or vaccine not available ( )
   Children ill ( )

10. Do you have immunization card?
    Yes ( )  NO ( )

11. If the card not available please explain the following?
    Vaccine was taken ( )
    Number of vaccine D and time of dose ( )
12. Immunization status?
   Complete (  ) partial (  ) non immunization (  )

13. Do you know definition immunization?
   Yes (  ) NO (  )

14. Do you know types?
   Yes (  ) NO (  )

15. Do you know the goals from immunization process?
   Yes (  ) NO (  )

16. Explain the side effect of immunization?
   Yes (  ) NO (  )

17. What the immunization complication?
   Yes (  ) NO (  )

18. You know how deal side effect?
   Yes (  ) NO (  )

19. Do you favorite immunization?
   Yes (  ) NO (  )

20. If responded via no that related to:
   Phobia from side effect (  )
   Complication or child ill (  )

21. Do you know information about definition s-s and complication (diphtheria –
    tetanus – poliomyelitis and tuberculosis – whooping cough)
   Yes (  ) NO (  )

22. Do you listen about definition – signs and symptoms and complication of tetanus?
   Yes (  ) NO (  )