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ASSESSMENT OF MOTHERS' KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING NATIONAL IMMUNIZATION PROGRAMME IN AL-DIWANIYAH CITY IN IRAQ

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ASSESSMENT OF MOTHERS' KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING NATIONAL IMMUNIZATION PROGRAMME IN AL-DIWANIYAH CITY IN IRAQ

BY

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The Degree of Master of Science in Nursing

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ETHICS STATEMENT

The thesis entitled “Assessment of Mothers’ Knowledge, Attitudes and Practices regarding National Immunization Programme in AL-Diwaniyah city in Iraq” which was prepared and presented as a thesis, was written by myself and in accordance with the scientific, academic rules and ethical conduct. The idea/hypothesis of my thesis solely belongs to my supervisor and to me. The research pertaining to the thesis was conducted by myself and therefore, all of the used sentences and interpretations within the work belongs to me.

I declare the aforementioned issues to be correct.

29 July 2022

WAEL SALIM LAHMOOD AL-NAIELI

ABSTRACT

ASSESSMENT OF MOTHERS' KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING THE NATIONAL IMMUNIZATION PROGRAMME IN AL-DIWANIYAH CITY IN IRAQ

WAEL AL-NAIELI

Master of Science in Nursing

Advisor: Asst prof. Dr. YAŞAR KEMAL YAZGAN

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Background: Vaccination is a cost-effective public health strategy that reduces morbidity, death, and disability in children. However, many children do not receive the required immunizations.

Understanding, the attitudes, and actions of mothers are crucial to vaccinating infants by their first birthday. Accordingly, successful immunization depends on parents' knowledge and attitude.

Objective: To assess the knowledge, attitudes, and practices of mothers in Al-Diwaniyah city about child immunization, and the link between these factors and the demographic characteristics of the mother**.**

Methods: The study was conducted on 390 mothers using the G.Power program. It took from 15 to 20 minutes to fill out the questionnaire, From reluctant mothers to health care centers in the Iraqi city of Diwaniyah during the period 2021-2022.

Results: The results showed that mothers with higher educational levels had better knowledge, attitudes, and practices towards vaccination. 58.7 of the mothers had poor knowledge and the majority had good attitudes and bad practices toward vaccination.

Conclusion: Study results show that mothers who, hesitate to go to primary health care centers have poor knowledge, positive attitudes, and rather poor practices.

The most important proposal was to create an educational program taking into account the educational level of the mothers.

2022, 123 pages

Key Words: Assessment, Mothers, Knowledge, Attitudes, Practices, Immunization Programme.

ÖZET

IRAK'IN AL-DİWANİYAH ŞEHRİNDE ANNELERİN ULUSAL AŞILAMA PROGRAMINA İLİŞKİN BİLGİ, TUTUM VE UYGULAMALARININ DEĞERLENDİRİLMESİ

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Temmuz 2022

Giriş: Aşılama, çocuklarda morbiditeyi, ölümü ve sakatlığı azaltan uygun maliyetli bir halk sağlığı stratejisidir. Ancak birçok çocuk gerekli aşıları alamamaktadır.

Annelerin anlayışı, tutumları ve eylemleri, bebeklerin ilk doğum günlerine kadar aşılanması için çok önemlidir. Dolayısıyla başarılı bir bağışıklama, ebeveynlerin bilgi ve tutumuna bağlıdır.

Amaç: Bu çalışmanın amacı Irak'ın AL-Diwaniyah şehrindeki birinci basamak sağlık ocaklarında annelerin çocuklara yönelik aşılamaya yönelik bilgi, tutum ve uygulamalarının değerlendirilmesi, ve Annelerin çocuklarına aşılamaya yönelik bilgi, tutum ve uygulamaları ve annelerin ve çocukların sosyodemografik özellikleri, arasındaki ilişkinin belirlenmesi.

Yöntem Araştırma: Çalışma G. Power programını kullanan 390 anne üzerinde yapılmıştır. 2021-2022 döneminde, sık annelerden Irak'ın AL-Diwaniyah kentindeki sağlık merkezlerine anketi doldurmak 15 ila 20 dakika sürmüştür.

Bulgular: Araştırmanın sonuçları, eğitim düzeyi yüksek annelerin aşılamaya yönelik bilgi, tutum ve uygulamalarının daha iyi olduğunu göstermiştir. Annelerin 58.7'sinin bilgisi yetersiz, çoğunluğunun aşıya yönelik iyi tutumları ve kötü uygulamaları vardı.

Sonuç: Araştırma sonuçları birinci basamak sağlık ocağına gitmekte tereddüt eden annelerin yeterli bilgi eksikliği ve uygulamalarının çok kötü olduğunu ve tutumlarının orta düzeyde olduğunu göstermektedir.

En önemli öneri, annenin eğitim düzeyini dikkate alan bir eğitim programı oluşturmaktı.

2022, 123sayfa

Anahtar Kelimeler: bilgi, değerlendirme, anneler, tutumlar, uygulamalar, Bağışıklama Programı

PREFACE AND ACKNOWLEDGEMENTS

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WAEL SALIM LAHMOOD AL-NAIELI
Çankırı-2022

CONTENTS

INDEX OF ABBREVIATIONS AND SYMBOLS

ACIP	American College of Immunization Physicians
AEFI	Adverse Events Following Immunization
AP	Acellular (cell-free) pertussis
BCG	Bacillus of Calmette and Guerin
CDC	Centers for Disease Control and Prevention.
CRS	Congenital rubella syndrome
CSM	Cerebro-Spinal Meningitis
DtaP	Diphtheria, tetanus, pertussis
DTwP	Diphtheria toxin, tetanus toxin and whole-cell pertussis vaccine.
EPI	Expanded Program on Immunization.
GAVI	Global Alliance for Vaccinations and Immunization.
GVAP	Global Vaccine Action Plan
HepB	Hepatitis B.
HIB	Haemophilus Influenza type b.
IPD	Invasive pneumococcal disease.
IPV	Inactivated Polio Vaccine.
LAV	Live attenuated
MCV	Measles-Containing Vaccine
MMR	Measles, Mumps and Rubella.
NBPP	Non-bacteremic pneumococcal pneumonia
NHMIS	National Health Management Information System.
OPV	Oral polio vaccine
PAHO	Pan American Health Organization.
PCVs	Pneumococcal conjugate vaccines.
PHCS	Primary Health Care Cent
TB	Tuberculosis
TT	Tetanus toxoid.
VPDs	Vaccine-Preventable Diseases.
WHO	World Health Organization.

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1. INTRODUCTION

Even though the newborn's immune system begins to function early in gestation, many of its responses do not work effectively during the early neonatal period, indicating that the infant was at high risk of infection acquisition and could not respond for extended periods to fight infections. Therefore, children constantly need extra attention to live and grow. The recommended main routine vaccination schedule, which starts early infancy and is finished throughout early childhood, provides this attention and support (Hockenberry *et al*. 2015).

There is an immunization program in every country in the world, and its primary goal is to provide certain vaccinations to the people who need them the most. These include pregnant women, newborns, and toddlers at an increased risk of diseases that vaccines may prevent. There are at least 27 causative agents against which immunizations are available, and the development of vaccines against many other agents is now in progress (Lahariya 2014).

Immunization is described as administering numerous chemicals in various forms to a person to encourage the production of antibodies and the induction of immunity against illness. There are many techniques for administering different substances. The administration of these substances, known as vaccines, helps prevent illness, disability, and death caused by Vaccine-Preventable Diseases (VPDs). Polio, Hepatitis B, Measles, Diphtheria, Rubella, Tetanus, Pertussis, and Haemophilus influenza type b (Hib) are just a few diseases that can be prevented through immunization (Allender *et al*. 2014).

Disease prevention is one of the essential goals in child care during infancy and development. Most health care providers are familiar with vaccination schedules and are aware of potential delays. However, parents must be educated about the first doses of child immunization. Every year, 500,000 and one million kids die from measles, and more than one million people die from hepatitis B (Abdul Alabass *et al*. 2020).

Children throughout the globe die from communicable and infectious illnesses, which are among the leading causes of mortality for children. This is true even more so for those most vulnerable to these illnesses. Nevertheless, even though children's immune systems are still developing, there has been an enormous drop in the number and severity of contagious and infectious diseases in the last few years, thanks to vaccines, antibiotics, antiviral drugs, and antitoxins. Some illnesses have been successfully managed, but the great majority will not be eradicated in the foreseeable future. New diseases are emerging, and existing conditions reappear, sometimes in a drug-resistant form, which is concerning (Nshimyimana 2014).

For example, appropriate vaccination delivered at the age before significant exposure to natural infection for infant immune development helps avoid many viral disorders. The immunization schedule in Iraq follows as hepatitis B (HepB) first dose at birth; Bacillus of Calmette and Guerin (BCG) in the first week; oral polio vaccine(OPV) at birth, 2nd, 4th, 6th, 18th months, and 4-6 years; Hexavalent (diphtheria, tetanus, pertussis (DTaP), Hib, HepB and inactivated polio vaccine(IPV)) at 2nd, 4th, 6th months; (DTwP, Hib, HepB) at 4-6 years; (DTwP, Hib, IPV) at 18th months; measles at 9th months; measles, mumps and rubella (MMR) at 15th months and 4-6 years; Rotavirus 2nd -4 the months; vitamin A at ninth -During the 18th month and the next 4-6 years; influenza at six months and two years. It is not mandatory to immunize children in Iraq; nonetheless, vaccinations are provided to all children at no cost by the government (WHO 2017).

The anti-vaccination movement's dissemination of erroneous and irresponsible information has significantly influenced. Consequently, assessing mothers' knowledge about pediatric immunization is critical for developing measures to combat vaccine-preventable illnesses (Ahmed *et al*. 2018).

One of the most fundamental strategies for minimizing infectious illnesses is positive awareness and a proper attitude about vaccination (Tabassum *et al*. 2017).

The factors contributing to reduced vaccination rates have been extensively studied in the public health literature. It is becoming more difficult for parents and caregivers to

keep track of their children's immunization status as the number of vaccinations increases and the vaccination schedule changes (Pothapragada 2020).

Certain factors, such as the mother's educational background, age, marital status, socioeconomic situation, and religious background, influence the effective use of child immunization. In affluent countries, vaccination programs are more well-organized, but the problem is dire in the world's most populous countries. Vaccination is the primary method of preventing childhood disease and is administered to infants as soon as they are born. Children's immunization aims to provide primary prevention against deadly diseases during childhood. Several precious lives are lost to these diseases worldwide, particularly in the third world, such as Africa and Asia (Mojoyinola *et al*. 2012).

According to several research findings, there is a favorable relationship between parental awareness and practice and the vaccination rates of children (Omer *et al*. 2014).

According to CDC research from the global immunization division, parental awareness and attitudes about vaccination services are poor, and parents have unfavorable ideas about measles and immunization programs. As a result, parental vaccination attitudes and beliefs have a role in determining a child's immunization status (Birhanu *et al*. 2016).

Parents are the prominent people who make decisions about their kids' health, and their knowledge about immunization, in general, has a significant impact on how well their kids are vaccinated. There is much conflicting vaccine safety information and misinformation on the internet, making it hard for parents to make good decisions. Thus, it is essential to determine how well parents know and act on their children's immunizations to improve and expand the coverage and completeness of vaccines (Fares KK *et al*. 2016).

The fear of vaccination by parents was thought to be one of the most significant barriers to getting their kids vaccinated when they were young. This is because parents do not

know about the side effects of vaccines and do not think vaccines are safe when they are healthy (Mugada *et al*. 2017).

As a result, it has been reported worldwide that effective vaccination depends on the knowledge and attitude of the parents (Nisar *et al*. 2010).

Lack of knowledge or information about vaccination, low awareness or unfavorable attitudes, and misperceptions or rumors about vaccine safety are significant barriers to high vaccination coverage among children (Birhanu *et al*. 2016).

The majority of parents have a negative view regarding childhood immunization programs. Furthermore, some parents believe that the polio vaccine would reduce their children's fertility rate; hence, parents' attitudes play an essential role in the vaccination process because they are the ones who make the decisions for their children (Falade 2014).

Immunization and immunization regimens are more complicated for mothers who do not understand them. As a result, they are more likely to have kids who are not or only partially immunized. "Immunization uptake is assumed to be impacted by mothers' awareness of immunizations and attitudes toward them and how their children get the vaccines successfully. If a mother is unsure whether or not her child should be vaccinated, she needs to learn about the benefits and risks of vaccines (Awosika 2012).

Therefore, the mothers' understanding, attitudes, and actions are critical in ensuring their children get all their vaccines by reaching their first birthday (Ramadan *et al*. 2016).

As a result, health care practitioners should work to increase parents' awareness and excellent understanding of vaccination and deliver accurate information about the advantages and hazards of vaccinations to children. Aside from that, vaccination providers have a favorable impact on a mother's choice to get her child immunized. For

this reason, on a personal level, health care providers, such as public health nurses and school nurses, can evaluate, educate, and create chances for a kid to get the vaccination (Bahari *et al.* 2014).

Neonatal immunization has recently received renewed attention due to recent advances in our understanding of neonatal immune responses and that humans depend on vaccination early in life. In addition, neonatal immunization has been identified as an effective method of reducing morbidity and mortality in newborn babies. As a result, early life immunity, particularly newborn immunization, is essential for public health and should not be disregarded (Kollmann *et al*. 2012).

With general information and communication technology, vaccine and immunization information will be developed, transferred, and made available to vaccination providers, caregivers, and vaccine recipients in new and innovative ways (Sobanjo *et al*. 2020).

1.1. The importance of study

Vaccination is an excellent tool for preventing infectious illnesses; nevertheless, nations with effective vaccination programs claim that their children enjoy better health due to decreased morbidity and mortality (Dhia *et al*. 2015).

Immunization is one of the WHO's core public health measures. It reduces morbidity, mortality, and disability in children cost-effectively. However, a percentage of youngsters are not adequately vaccinated (Kassahun *et al.* 2015).

Vaccination is critical to reducing the illness burden in early childhood. It is estimated that vaccination prevents between 2 and 3 million fatalities every year. According to the World Health Organization, 19.5 million children have not received a primary immunization. Global vaccine coverage has reached an impasse at 86 percent, with no significant advances seen in the last calendar year (Srikanth *et al.* 2019).

As part of the expanded immunization program, numerous vaccine-preventable illnesses before regular vaccination contributed to more than 5.9 million children under five who died in 2015 (Liu *et al.* 2016).

Vaccine-preventable diseases are a leading cause of death in children under five. Vaccines help prevent maternal and neonatal tetanus, measles, and rubella but continue to plague children worldwide. One of the most contagious illnesses, measles, is spread. It is caused by a virus that affects the respiratory system and causes inflammation. According to the World Health Organization, in 2013, an estimated 84 percent of children globally got measles vaccines. Nevertheless, every day, 367 children die from measles throughout the globe, despite the availability of a safe, effective, and inexpensive immunization (Adefolalu *et al*. 2019).

WHO and UNICEF (2009) estimated that 2.1 million people died worldwide in 2002 from diseases that may have been averted with widely available vaccinations. This death toll included 1.4 million children under the age of five. Although global routine immunization coverage with the first dose of measles-containing vaccine (MCV) reached 82 percent in 2007, over 23.2 million children missed the vaccine, with 65 percent (15.3 million) living in eight South American countries (Belachew *et al*. 2011).

Vaccination has lowered pediatric disorders' incidence, recurrence, and regeneration globally in the United States and other areas. However, according to regular National Health Management Information System (NHMIS) statistics, the VPDs were the second and third leading causes of under-five mortality and infant mortality. In 1999, these illnesses claimed the lives of 22 percent of newborns and children under the age of five. Cerebro-Spinal Meningitis (CSM, 2%), measles (3%), pertussis (6%), and neonatal tetanus (6%) were the most common among babies (11 percent of deaths). Measles accounted for 5% of recorded mortality among children under five, CMS 6%, pertussis 6%, and newborn tetanus 5% (Omole *et al.* 2012).

In the developing world, it not only averts about 3 million child deaths each year but can also prevent additional 2 million deaths if immunization programs are expanded and implemented (Tagbo *et al.* 2012).

Vaccines are undeniably an essential component of the health care system (Wani *et al*. 2017).

Vaccinating a child with the proper immunizations would considerably reduce disease treatment costs and rates and improve the child's quality of life. (Fad et al., 2017). Moreover, it is an effective tool for controlling diseases worldwide. (Sunny et al., 2018). Moreover, the most cost-effective mechanism for preventing morbidity and mortality. In addition, it allows people to better protect themselves against specific bacteria and viruses (Lamiya *et al.* 2019).

Therefore, children should get all their immunizations at the specified intervals and at the appropriate age to get the most protection against infections (Joseph *et al*. 2015).

1.2. Problem statement

A study on the mother's knowledge, attitudes, and practices regarding the national immunization program in Diwaniyah in Iraq .

One of the main obstacles to high child immunization coverage is the lack of knowledge, attitudes, and practices about immunization and mothers' low levels of awareness or negative attitudes towards immunization. Therefore, determining the level of understanding of mothers regarding the vaccination of children and their attitudes towards vaccination and increasing mothers' knowledge has a significant role in preventing many diseases or reducing their impact.

1.3. Research hypothesis

H_1: Null hypothesis: there is no significant positive or negative association between mothers' knowledge, attitude, and practice of the National Immunization Programme with mothers and children's sociodemographic characteristics of age, education, occupation, marital status, economic status, source of information about vaccination, child age, immunization status–up-to age and reasons of partial immunization at $p > 0.05$.

H_2: Alternative hypothesis: there is a significant positive or negative association between mothers' knowledge, attitude, and practice about the National Immunization Programme with mothers and children's sociodemographic characteristics of age, education, occupation, marital status, economic status, source of information about vaccination, child age, immunization status– up-to age and reasons of partial immunization at $p \leq 0.05$.

H_3: Null hypothesis: There was no significant difference in knowledge, attitudes, or practices using a significance level of $p > 0.05$.

H_4: Alternative hypothesis: There is a considerable gap in knowledge, attitudes, and practices at $p \leq 0.05$**.**

1.4. The objective of the study

- Assessment of mothers' knowledge, attitudes, and practices about the National Immunization Programme in Al-Diwaniyah, Iraq.
- Determine the relationship between mothers' the knowledge, attitudes, and practices about the National Immunization Programme and the sociodemographic characteristics of mothers and children, including age, education, occupation, marital status, economic status, source of information about vaccination, child age, immunization status–up to a generation, and reasons for partial immunization.

1.5. Limitations of the study

1. Because of the dispersed distribution of the PHCCs, data collection is demanding and time-consuming to complete.
2. The lack of statistics for the number of children vaccinated per month in the primary health care centers.
3. Some mothers refused to participate in the study.

2. LITERATURE REVIEW

This chapter's purpose is to review pertinent literature and research on the phenomenon under consideration.

2.1. Historical background

In the years following the discovery of the smallpox vaccine by Edward Jenner, the terms "vaccine" and "vaccinology" became widespread. Jenner called the Smallpox vaccination "variola vaccinate" who coined the word. Because of his contributions to the subject of vaccinology, Jenner is frequently referred to as the "Father of Vaccinology" (though this epithet is sometimes also used for Louis Pasteur) (Lahariya 2016).

In the time leading up to Jenner's discovery, the most common form of vaccination against The smallpox virus was a variant, which has been called "the first known inoculation technique" and has been used for millennia around the globe to prevent the spread of the disease. Evidence exists that this variation included "exposing a healthy person to infected material from a person with smallpox in the hopes of producing a mild disease that would provide immunity from further infection." It was practiced throughout the latter half of the seventeenth century in Turkey and Africa and spread to America and Europe. After successfully using cowpox material to develop protection against smallpox, Edward Jenner's discoveries were being developed when he achieved success in 1796, stopping the widespread practice of vaccination (Termanini 2016).

The term "vaccine" was coined by Swiss physician Louis Odier (1748-1817), while "vaccination" and "to vaccinate" were coined by 18th-century physician Richard Dunning (1710- 1797) (Mahmmod *et al.* 2021).

Louis Pasteur owes a debt of gratitude to the whole planet. The French science society considers Louis Pasteur the most exemplary scientist France has ever produced. Since

1885, antirabies medication has saved tens of thousands of lives worldwide. Even though the first vaccination (the rabies vaccine) was created in the late 18th century, people were aware of the value of immunity far earlier. Then, during the Birth of bacteriology, new advancements occurred quickly. During the 1930s, antitoxins and vaccinations against T.B., diphtTetanus, cholera, the plague, anthrax, typhoid, and other diseases were discovered and developed (Smith 2012).

Historically, it was the legal notion of exemption that gave Birth to the Latin terms immunity and immunize: first, Roman law defined the exemption of a person from service or obligation; subsequently, in the Middle Ages, they described the exemption of the Church and its property from public supervision. According to Antoinette Stettler, this expression was first documented in the context of illness in the 14th century, when it was used to allude to his flight from a plague pandemic (Abbas *et al*. 2018).

On the other hand, the invention of vaccinations is one of the most critical public health triumphs in recent history. According to legend, the first documented efforts to prevent illness by utilizing the disease-causing organism against itself date back to the 7th century in India, when Buddhist monks ingested snake venom to create immunity against snake bites (Lahariya 2014).

When Chinese medics began blowing dried smallpox scabs into the nostrils of healthy persons, the healthy individuals acquired a minor form of the illness, and the patients who recovered were resistant to smallpox in the 10th century; the practice was widely adopted around the world. In the 1700s, this technique, known as inoculation or variolation, expanded to New England and Europe, where it is still used (Plotkin *et al*. 2013).

However, the novelist Mary Wortley Montagu (1689-1762) is credited for campaigning for variolation in England. In 1717, Edward and Mary Montagu traveled to what is now Turkey with their infant son, and they were the first to do so in England. When she moved to the Ottoman Empire, she found the native practice of variolation, which is the

vaccination against smallpox. This was her first year in the country. In contrast to Jenner's subsequent vaccine, which used cowpox, variolation used a bit of the actual smallpox virus. As someone whom the sickness had afflicted, Lady Mary advised her children to get immunized while on vacation in Turkey. As soon as she returned to London, she promoted the surgery vigorously, but she quickly found significant opposition.

On the other hand, her example undoubtedly helped spread the practice of smallpox vaccination among the upper classes of British society in 1721. Nevertheless, the number of people who received vaccinations remained limited, and medical efforts throughout the eighteenth century were concentrated on reducing the risks and adverse effects of the inoculation procedure (Zaimeche *et al*. 2010).

The introduction of modern vaccinations coincided with the outbreak of the Second World War. In the late 1940s, new technologies for creating vaccines were discovered, leading to the development of several new vaccines. However, vaccine structure varies depending on the procedure used to make it. Depending on the method used to create it, it can be composed of live inactivated organisms, organism toxins, specific antigen extract, or killed pathogens. A few vaccinations have had antibiotics or proteins added to them to increase their effectiveness. Dr. Pert and Dr. Salk produced whole-cell pertussis vaccinations, while Dr. Salk developed the polio vaccine. Sabin refined the attenuation process first devised by Louis Pasteur and used it to create the oral polio vaccine, ultimately responsible for eliminating polio globally. Today's method uses conjugating a polysaccharide antigen from an organism with a carrier protein to generate vaccines against (Hib) and, more recently, against streptococcal and meningococcal illnesses (Sehume 2011).

Regarding vaccine research and development, the middle of the twentieth century was a hectic period. Cultivating viruses in the laboratory resulted in quick advances and discoveries, including the invention of vaccinations to prevent polio. Researchers sought to eradicate measles, mumps, and rubella, among the other frequent childhood illnesses. Vaccines for these diseases significantly lowered the disease burden. In

addition, scientists are being propelled in new directions by better methodology in vaccine development and innovative delivery technologies for recombinant D.N.A. technology. As a result, disease targets have widened, and some vaccination research concentrates on noninfectious problems such as addiction, allergies, and infectious diseases (Termanini 2016).

2.2. Expanded program on immunization (EPI)

The Expanded Programme on Immunization of the WHO made vaccination against six illnesses obligatory in 1974. (WHO). This program ensured that all infants had access to the four recommended vaccines (Bacillus Calmette-Guérin vaccine [B.C.G.], diphtheria, te (tuberculosis, diphtheria, tetanus, Pertussis, Poliomyelitis, and measles). Additionally, additional vaccinations and dosages have been introduced in the first year of life (PCV, rotavirus, R.C.V., Hib, and HepB) and beyond (MCV2 and HPV) since then (MCV2 and HPV) (MCV2 and HPV) (Uwizihiwe J *et al*. 2015).

Beginning in 1974, with the beginning of the Expanded Immunization Program (EPI), the (WHO) spearheaded the international movement toward the use of vaccines as a public health intervention. As a result, several worldwide initiatives to enhance EPI coverage have been launched, notably the Universal Childhood Immunization Program (Okwo-Bele *et al.* 2011).

Childhood vaccination programs have had a significant impact on the mortality of children across the world. According to estimates from the Pan American Health Organization (PAHO), almost 174 000 fatalities were averted in The Caribbean and Latin America between 2006 and 2011 due to vaccines for young infants under five (Etienne 2018).

The Americas Zone was the first WHO region to eradicate poliomyelitis in 1994. In 2015 and 2016, the Americas Region was proclaimed free of measles, rubella, and CRS (PAHO 2017).

According to the World Health Organization (2013), vaccination is a proven technique for managing and eradicating infectious diseases. Between 1967 and 1977, the World Health Organization (WHO) successfully eradicated smallpox. When the program began, the illness was still a threat to sixty percent of the world's population and claimed the lives of every fourth victim. The eradication of Poliomyelitis is now a realistic possibility. Since the WHO and its partners launched the Global Polio Eradication Initiative in 1988, cases have plummeted by 99.99 percent. The campaign saved the lives of almost 5 million individuals. By 1990, Vaccination has protected over 80% of children worldwide from the six core EPI illnesses. Many countries regularly add additional immunizations to the EPI program. The WHO has established the Global Alliance for Vaccinations and Immunization (GAVI) to assist the poorest nations in adopting new and underused life-saving immunizations (WHO MODULE 2018).

From 2006 to 2011, almost 174,000 fatalities were averted throughout The Caribbean and Latin America due to the vaccination of children under the age of five, commonly ascribed to the Expanded Program on Immunization (EPI) and other initiatives (EPI). However, despite the widespread adoption of EPI guidelines worldwide, immunization coverage varies significantly across different geographical locations (Llau *et al.* 2021)**.**

Every country has an immunization program to protect pregnant women, babies, and children against diseases that vaccinations can prevent. Vaccines exist for at least 27 causative agents, and many more are being developed (Lahariya 2014).

According to (Abbas *et al*. 2018), EPI's key global goals are as follows:

- Reduce the number of children who die from vaccine-preventable diseases, including tuberculosis, measles, mumps, rubella, pertussis, diphtheria, and Poliomyelitis.
- The objective is to minimize maternal mortality while also reducing measles infection.
- To immunize all newborns and children against measles, the most vaccine-preventable illness.
- Elimination of tetanus in pregnant women and newborns.
- To lower the prevalence of tuberculosis among children.

- Improve vaccination coverage to at least 95% throughout the country and 80% across all towns and cities.
- Improvement of economic and financial well-being in the community.
- To eliminate Poliomyelitis and reduce disability caused by polio.
- To promote the health of both the mother and the kid.
- To keep rubella syndrome from getting worse.
- To bring innovative vaccinations and technology.
- To make sure that everyone in every region and community has been vaccinated.
- To make sure that all children in all countries got vaccines that could have saved their lives, the resolution asked countries to build on the success of the global smallpox eradication program.

2.3. Expanded program on immunization (EPI) in Iraq

Despite limited resources, constantly increasing demand for health care, the development of breakthrough cures, and rising healthcare expenses, National and local health authorities must establish priorities for health needs and make judgments about how much money should be invested in the health system to meet those requirements (Lajoie 2013).

The burden of sickness is a measure that collects indications concerning the effect of illnesses and the variables that increase the likelihood of developing them that accompany them on people, governments, and society (Honeycutt A *et al*. 2011).

Iraq is a developing country with a high middle-income level (World Bank 2011).

From the 1960s through the 1980s, it boasted the Middle East's most sophisticated health system. For almost all urban and rural people, free health care at 172 hospitals and 1200 basic health facilities was made possible by oil revenue. Launched in 1985, the EIP (Lafta *et al.* 2018).

Iraq was polio-free, and measles epidemics were nearly halted (WHO EMRO 2016).

However, the vaccination program became fragmented due to increased war and widespread population relocation. As a result of limited access to healthcare services, there was an increased danger of epidemics of infectious illnesses, and efforts to control these infections were hampered (WHO 2014).

Nationwide measles vaccine coverage has decreased to 75 percent Instead of the required 95 percent (OCHA 2007-2017).

The wild measles epidemic from Syria in 2014 followed an outbreak in 2008/2009 (USAID 2015).

Vaccination failure increased to 60.1 percent (Jasem J *et al*. 2012).

The erratic power supply in Iraq, especially in battle zones, hampered the polio vaccine cold chain (Webster, 2014).

This occurred when an injectable bivalent vaccination replaced the oral trivalent polio vaccine (Ashok *et al*. 2017).

Although the tuberculosis vaccine was first provided in Iraq in 1989 as part of the national vaccination program (and then by the Department of Health and Social Welfare in 1998), Iraq continues to have the highest incidence of tuberculosis cases, with over 15000 cases every year (UNDP 2015).

According to the most recent data, the incidence was 43/100000 in 2015, with a small multi-drug resistance rate (3.3/100000), representing 1.1 percent of all new and relapsed tuberculosis cases in that year (WHO 2018).

An international study of human development ranked Iraq 121st in 2016. According to UNDP data, 5% of Iraqis lived in poverty in 2015. 3.3 percent of total G.D.P. was spent on health care. Health has gone downhill. Medicines and other supplies are scarce, limiting people's access to needed health care (WHO EMRO, 2018).

When comparing 1990 and 2013, polio vaccination coverage among one-year-olds decreased from 83.0 percent to 70.0 percent, DTP3 vaccination coverage fell from 83.0 to 68.0 percent, B.C.G. vaccination coverage decreased from 96.0 to 90.0, and measles vaccination coverage decreased from 75 percent to 63 percent. In contrast, coverage for tetanus has increased from 70 percent to 72 percent throughout the same period. In addition, in 2013, 66 percent of one-year-olds were immunized against the Hepatitis B virus (WHO EMRO regional office 2018).

In 2012, Iraqi children received IPV, Hib, and rotavirus vaccinations at 2, 4, and 6 months. Iraq was therefore officially removed from the list of infected states, a historic achievement made possible by the WHO's sustained engagement since May 2015. However, the EPI program in Iraq had the following main objectives: (Abbas *et al*. 2018).

- Deaths and morbidity from illnesses targeted by the EPI are declining.
- By 2015, we will have stopped the transmission of Poliomyelitis.
- Rubella and C.R.S. (congenital rubella syndrome) must be eliminated, and measles epidemics must be controlled.
- Maintaining the eradication of Maternal and Neonatal Tetanus (MNT) in the population.

2.4. Type of vaccines

Many different types of vaccinations are classified according to the antigen used in their manufacture. How they are used, how they are kept, and how they are delivered are all influenced by their formulations. The vaccinations that are universally recommended are divided into four categories (Mort *et al.* 2013).

1. **Live attenuated (LAV)**

- Tuberculosis (TB) (B.C.G).
- A polio vaccination that may be taken orally (OPV).
- Measles.
- Rotavirus.
- The yellow fever virus.

2. **Defused (Killed antigen).**

- Pertussis whole-cell.
- polio virus that has been inactivated (IPV)**.**

3. **a subsystem (Purified antigen).**

- Pertussis acellular (aP).
- The type b of the Hemophilus influenza (HIB).
- Pneumococcal bacterial infections (PCV 7, PCV 10, PCV 13).
- The hepatitis B virus (Hep B).

4. **Toxoid (inactivated toxin).**

- The toxoid for tetanus (T.T).
- The toxoid for Diphtheria.

2.4.1. Bacillus calmette guérin vaccination in humans (BCG)

The Bacillus Calmette-Guerin (B.C.G.) vaccine was launched in 1921 after 13 years of study (Luca S *et al*. 2013).

By repeated sub-culturing (231 passes), A glycerinated bile potato medium was used by Calmette and Guerin to get their vaccine. The initial immunization dose was administered orally until the 1970s, when the WHO advised the intradermal method (Dagg B *et al.* 2014).

The globe, BCG vaccination is administered to most children, with two-thirds of the nations that administer BCG immunization estimated to have >90 percent vaccine coverage (WHO-UNICEF. 2020).

The WHO recommends BCG immunization shortly after delivery. However, because vaccine coverage is commonly estimated at one year of age, many newborns have been inoculated later than recommended (Kagoné *et al.* 2017).

This substantial vaccine coverage has not stopped TB spread. In 2019, there were 10 million TB diagnoses and 1.4 million deaths (Dockrell *et al.* 2020).

BCG vaccination can potentially provide non-specific protection against other infections (de Castro *et al*. 2015).

Moreover, decrease all-cause mortality in newborns (Biering-Sørensen *et al*. 2018).

The World Health Organization (WHO) advises that all B.C.G. vaccinations used in immunization programs meet WHO guidelines. B.C.G. is the only Tuberculosis (T.B.) vaccination presently available. However, although B.C.G. has proven excellent efficacy in specific communities, protection has not been constant across all T.B. strains or all age groups in these populations. In addition, when B.C.G. is administered as a post-exposure prophylactic, there is no evidence that it is beneficial in preventing infection. As a result, numerous novel tuberculosis candidate vaccines are being developed, with several now through advanced clinical testing. The usage of these vaccines is intended for use as booster vaccinations after neonatal B.C.G. immunization (Lahey *et al*. 2017).

Although effective against pulmonary T.B. in adults, it depends on geographic location, vaccine strain, and prior exposure to environmental mycobacterial infections (Mangtani P *et al*. 2014).

Almost immediately after the first dose of the B.C.G. vaccine was provided in 1921, various governments began conducting universal B.C.G. vaccination programs for their respective populations. As a result, various epidemiological studies established if the vaccination successfully cut T.B. mortality in vaccinated patients. Interestingly,

however, these analyses rapidly indicated that the immunization might lower newborn mortality to a higher level than could be explained by its effect on tuberculosis (T.B.) alone (Shann F 2013).

Many B.C.G. vaccinations are available on the market, each based on a distinct B.C.G. strain. In most cases, B.C.G. vaccinations are delivered by intradermal injection. For certain products, percutaneous administration via a multi-puncture device has been approved. To guarantee proper dose and maximal B.C.G. vaccination effectiveness and safety, the vaccine must be administered by a skilled health professional using the appropriate vaccine administration method. Because of local inflammatory processes, the B.C.G. vaccine often results in a scar at the injection site. But scar development is not a reliable protection indicator, as around 10% of vaccination recipients do not acquire a fault after receiving the vaccine (Dhanawade *et al*. 2015).

2.4.2. Oral polio vaccine (OPV) and injectable polio vaccine

Oral poliovirus vaccines (OPVs) and inactivated poliovirus vaccinations (IPVs) are used globally to prevent polio transmission and have excellent efficiency. Compared with IPVs, OPVs are easier to use, have cheaper production costs, elicit stronger oral and intestinal mucosal immunity, and are more effective in blocking the transmission of wild poliovirus WPVs (Chen *et al*. 2022).

Before the invention of the inactivated and live oral poliovirus vaccines, occasional outbreaks of poliomyelitis caused up to 18 000 paralysis cases and over 3000 fatalities in the USA alone (CDC Pink book 2018).

Combining the oral polio vaccine's simplicity of administration, high effectiveness, and low cost was crucial for mass vaccination campaigns' success in reducing polio. The WHO declared the eradication of wild polioviruses in the Americas in 1994. OPV, on the other hand, causes vaccine-associated paralytic polio. In 2012, 400 cases of

vaccination-associated paralytic polio occurred in countries that only utilized the oral polio vaccine (OPV) (Platt *et al*. 2014).

In 2019, the burden of wild polio was more than double the disease's incidence (Global Polio Eradication 2016).

Throughout 2019, more than 250 new instances of paralysis were linked to the transmission of vaccine-derived polioviruses (VDPV) (WHO Global Polio 2015).

After discovering a possible link between OPV and paralytic polio, several nations decided to switch to the more effective IPV. On the other hand, IPV generates a far less mucosal immune response than OPV (Hird *et al.* 2012).

Even though it is less effective in preventing disease transmission, it provides exceptional protection. In the Americas, for example, Canada was the first in 1995, followed by the US in 2000, Costa Rica in 2010, and Uruguay in 2012. However, the remaining 31 American nations continue to provide at least one dosage of OPV (Alfaro-Murillo *et al*. 2020).

Oral polio vaccines were discontinued worldwide in 2013 by the World Health Assembly. A universal conversion from trivalent to bivalent OPV would be followed by the deletion of the type 2 component in 2016. (containing only types 1 and 3). By the end of 2015, all 126 OPV-only nations should have at least one dose of inactivated polio vaccine in their routine vaccination regimens before switching from trivalent to bivalent OPV. This can assist reduce the possibility of immunity gaps after the removal of OPV type 2. Inactivated polio vaccine would limit the likelihood of reintroducing type 2 poliovirus by enhancing immunity against types 1 and 3 (Heinsbroek *et al*. 2010).

By April 2016, all 155 oral poliovirus vaccine (OPV)-using nations and territories had switched from trivalent (tOPV) to bivalent (bOPV), which includes both types 1 and 3 in their national vaccination regimens (Patel M *et al*. 2017).

This was the most significant product recall in history and the fastest introduction of a new vaccine—bOPV—in medical history. Meanwhile, all OPV-using nations tried to add at least one dose of inactivated poliovirus vaccine (IPV) into the children vaccination schedule to prevent paralytic poliomyelitis cases if poliovirus type 2 re-emerged (Sutter *et al.* 2019).

2.4.3. Hepatitis B vaccine (HBV)

The Hepatitis B vaccine is the most efficient method of avoiding HBV infection. The first licensed hepatitis B vaccine was made from the plasma of asymptomatic HBsAg carriers. The creation of a recombinant hepatitis B vaccination was made possible by using recombinant DNA technology (Zhao *et al*. 2020).

According to the (WHO) (HBV), the infection has a worldwide distribution. In 2015, 887 220 individuals died from diseases related to HBV infection worldwide, according to estimates from the WHO (Huynh *et al.* 2021).

Most HBV-related illness burdens were attributed to vertical or horizontal transmission in children under five (WHO 2012).

All countries should include the HBV vaccine in their national vaccination programs, according to a 1991 World Health Organization recommendation (Mahmmod *et al*. 2021).

To protect against hepatitis B, the first dosage is advised to be administered within 24 hours of Birth, with either two or three more doses administered after that (WHO *Global* Hepatitis B 2017).

Taiwan was the first to introduce a nationwide hepatitis B virus (HBV) vaccine program for infants in July 1984. The newborns received three to four doses of HBV vaccine, either plasma or recombinant. Children delivered to mothers who tested positive for HBeAg received 0.5 mL of hepatitis B immunoglobulin within 24 hours of birth (Ni *et al*. 2010).

2.4.4. Pneumococcal conjugate vaccines (PCVS)

Using pneumococcal conjugate vaccinations (PCVs) reduces pneumococcal serotype carriage (Roca *et al*. 2015).

It has been proven that PCVs prevent a disproportionately high incidence of episodes of otitis media in patients with non-bacteremic pneumonia or I.P.D. compared to those with non-bacterial pneumonia (Flasche *et al*. 2016).

PCVs are excellent in preventing pneumonia and invasive pneumococcal disease, and they are now being introduced in many resource-poor nations to combat these infections. PCVs, including pneumococcal serotypes, help minimize the nasopharyngeal carriage of the bacteria (vaccine types). Even though vaccine types are less likely to transmit and cause illness, non-vaccine kinds fill the ecological niche and become more abundant in carriage and disease (Weinberger *et al.* 2011).

Therefore, a predictor of vaccination efficacy is the influence of PCVs on the nasopharyngeal carriage (Simell *et al*. 2012).

Many industrialized nations presently utilize PCVs in their regular childhood immunization programs. Because children are the primary drivers of transmission (Hill et al., 2010). When children are vaccinated, they also protect older community members against the nasopharyngeal carriage and the spread of invasive illnesses (Roca *et al.* 2011).

As a consequence of the extensive use of pneumococcal conjugate vaccinations (PCVs) in many countries throughout the globe, the incidence and prevalence of invasive pneumococcal disease (I.P.D.), non-bacteremic pneumococcal pneumonia (NBPP), pneumococcal otitis media have all decreased in recent years (Ewald *et al* . 2016).

Vaccine tolerance is excellent and significant side effects are rare with conjugate vaccinations (Solanki *et al.* 2017).

Most research has identified no significant adverse impacts of particular concern, with some studies raising the possibility of an increase in asthmatic symptoms. The administration of these vaccinations to patients who have previously received unconjugated vaccines does not increase their intolerance to them (Urbancikova *et al*. 2017).

2.4.5. Tetanusu pertussisssisri tetanus, and pertussiss vaccine

A dramatic decline in pediatric pertussis incidence in the United States occurred with the introduction of the diphtheria-tetanus–whole-cell pertussis vaccination in the 1940s (Rane *et al*. 2021).

In most industrialized nations, the DTaP vaccines are considered safe and effective and are recommended for use in the newborn primary series of national immunization programs (Miller *et al.* 2014).

Booster doses for preschool and teenage children are also included in vaccination regimens, mainly in high-income countries, due to concerns about an increase in the age at which people get infected and a decrease in vaccine-induced immunity (Forsyth *et al.* 2018).

Even though the United States has a reasonable immunization rate, pertussis has been rising since the 1990s (Jackson *et al.* 2014).

Infants and young children receive the DTaP vaccination to protect them from diphtheria. They can cause life-threatening complications or even death in vulnerable people. The gram-positive bacillus Clostridium tetani produce neurotoxins that cause tetanus. Spores enter the body through mucous membranes or skin breaches. Toxins such as tetanospasmin are produced. This toxin inhibits neurotransmitter release, causing unopposed muscular contraction and spasms. C. tetani cannot be spread person-to-person; Clostridium tetanus is a gram-positive bacillus that produces neurotoxins that cause tetanus. The bacterium uses mucous membranes or an open wound to enter the body. Tetanospasmin, a potent toxin, is generated, along with other toxins. Neurotransmitter release is disrupted by this toxin, resulting in uncontrolled muscular contraction and spasms. Tetani does not spread from one person to the next (WHO Tetanus 2017).

The gram-positive bacillus Corynebacterium causes diphtheria. Droplets or intimate contact transmit the infection. Bacteria that thrive in the nasopharynx, mucous membrane lining, and skin lesions generate diphtheria toxins. Early indications and symptoms include fatigue, sore throat, and low-grade fever. A gray pseudo-membrane on the nasopharynx, tonsils, or larynx indicates the presence of bacteria. This pseudo-membrane may grow into the nasal cavity or larynx, obstructing airway flow. Once in the circulation, the toxin can induce cardiac and neurological disorders. Diphtheria is spread through droplets or close contact (Diphtheria vaccine WHO 2017).

Tularemia Whooping cough is a contagious respiratory disorder caused by the gram-negative bacillus Bordetella pertussis. This includes paroxysmal and catarrhal episodes. Cough, slight fever, and coryza are all catarrhal signs. Following infection, paroxysmal symptoms such as spasmodic coughing, posttussive vomiting, and inspiratory whoop emerge. Symptoms usually improve over weeks or months during the recovery stage. Airborne droplets from coughing or sneezing can transmit B. pertussis. The catarrhal or paroxysmal stages of illness are more infectious (WHO Pertussis 2015).

Local side effects, such as swelling, redness, and soreness at the injection site, were often reported with whole-cell pertussis immunizations, also known as DTP vaccines. In

the 1990s, DTaP vaccinations were introduced to replace DTP vaccines to lessen the incidence of these prevalent side effects. Seizures, hypotonic-hyporesponsive episodes, and protracted sobbing are among pertussis immunizations' less common side effects (WHO Pertussis 2015).

According to case reports and research examined by the WHO and the American College of Physicians, tetanus toxoids in vaccines can induce brachial neuritis. Brachial neuritis is a condition that can be severe, although it is rare and it is typically self-limiting (Liang *et al*. 2018).

In its recent assessment, the ACIP looked at various studies on the delivery of DTaP and other vaccinations simultaneously. Vaccinating with inactivated influenza and pneumococcal 13-valent conjugate vaccine or DTaP within 24 hours may increase the incidence of febrile seizures. With any combination of immunizations, the risk of febrile seizures is shallow overall, and this is true for any single vaccine. As a result, the American College of Immunization Physicians (ACIP) advises the simultaneous administration of these vaccines (Ogden *et al*. 2021).

Severe allergic reactions or anaphylaxis after receiving the DTaP vaccination or DTaP component Unknown encephalopathy (coma, lowered level of consciousness, or prolonged seizures) within seven days of DTaP medication is also a contraindication. Contraindications to DTaP vaccination should not be considered in the case of pregnancy (Cappozzo *et al*. 2021).

The DTaP dosage is 0.5 mL, which is administered intramuscularly. The anterolateral part of the thigh is the optimal intramuscular injection location for newborns and toddlers up to the age of two years. The deltoid muscle is the ideal injection location for youngsters three years of age and older (Liang *et al*. 2018).

2.4.6. Measles, mumps, and rubella vaccine (M.M.R.)

Implementing worldwide regular immunization programs using measles-mumps- and rubella-containing vaccines have drastically decreased the frequency of these infections and their accompanying mortality and morbidity (CDC Mumps 2018).

According to industry standards, most children get their first dose of the (M.M.R.) vaccine between 9 and 15 months. Another dose of the M.M.R. vaccination is often given to children between the ages of 15 months and six years old, with a minimum interval of 4 weeks between each dose. At least 97 percent of people are protected against measles and mumps after two vaccine doses. At least 88 percent are protected against rubella after the second vaccine dosage (WHO d 2017).

However, measles and mumps epidemics still occur—each for distinct reasons—in countries where safe and effective immunizations are available (Albertson *et al*. 2016).

In the first half of 2018, nearly 41,000 children and adults were infected with measles in the WHO European area (WHO Measles 2018).

In the United States, 349 measles and 2,251 mumps were reported in 2018. (Up to 29 December) (CDC Measles 2018).

Measles outbreaks occur predominantly in unvaccinated persons; hence, high vaccination coverage is essential for avoiding the disease. Mumps outbreaks, instead, may even occur in fully vaccinated areas. The primary proposed reason for mumps epidemics is a combination of the following: an increase in the number of susceptible individuals (such as those seen on college campuses), a decrease in antibody titers, lesser efficacy of mumps vaccinations compared to those for measles and rubella, as well as presently circulating strains for which cross-neutralization is less efficient (Lewnard *et al.* 2018).

The third dose of MMR vaccine has been suggested in the United States to assist lower the number of cases during a mumps epidemic, in addition to the standard measles, mumps, and rubella (MMR) immunization schedule critical for preventing mumps outbreaks (Marin *et al.* 2018).

The M.M.R. immunization has a long track record of safety, and severe adverse reactions to M.M.R. are infrequent in adults who get the vaccine. The theory that vaccinations are responsible for autism or autistic spectrum disorders does not have strong evidence to support it. The most frequent side effects are a fever and a mild rash, which typically emerge between 5 and 12 days after vaccination. According to a recent research study, adult women may be affected by arthralgias and other joint problems, which are considered to be caused by the rubella component of the virus. In addition, a link has been shown between M.M.R. vaccination and allergic reactions such as rash, pruritus, and purpura. These responses, however, are few, modest in severity, and occur within a short period following the vaccine. According to the C.D.C., allergic reactions occur less than once in a million immunization doses (Wang *et al*. 2021).

2.4.7. Haemophilus influenza type B (Hib) vaccine

Hib is a bacterial pathogen that causes pneumonia, meningitis, epiglottitis, and other diseases in children under five (Nandi *et al.* 2019).

Until the 1990s, Hib was the most prevalent cause of bacterial meningitis in children under five. Even though the incidence of Hib diseases has fallen significantly post-vaccination, Hib was responsible for over 29,000 fatalities in children under five worldwide in 2015 (Slack *et al.* 2020).

According to the WHO, from 2011 to 2020, the introduction of the vaccine in 73 countries sponsored by the Global Alliance for Vaccines and Immunizations (GAVI) is expected to save 1.4–1.7 million lives. (Lee *et al* .2013).

By 2014, it had been deployed in all GAVI-supported nations (Heinz 2018) .

According to several research, the Hib Vaccination lowers Hib colonization and increases other serotypes (Shirvani *et al*. 2019).

Currently, protein-polysaccharide conjugate Hib vaccines are being used in practically all nations worldwide as part of their routine vaccination programs (Wahl *et al*. 2018).

After ten years of Hib vaccination, the rate of Hib carriers in healthy children under five years of age was shallow (Zanella *et al*. 2015).

2.4.8. Rota virus vaccine

Rotavirus is the most common cause of severe diarrhea in kids, and it is responsible for the deaths of 125 000–200 000 children under the age of five every year (Troeger *et al*. 2018).

Two rotavirus vaccines were authorized in 2006 and promptly implemented into national vaccination programs worldwide. In 2009, following the demonstration of the efficacy of live-attenuated oral vaccinations in emerging countries in Africa and Asia, the World Health Organization (WHO) advised that rotavirus vaccines be included as a priority in national immunization programs worldwide (Burke *et al.* 2019).

Most African nations that have included rotavirus vaccine into their national Expanded Immunization Programs advocate giving it at the same time as diphtheria, tetanus toxoids, and pertussis (DTP) DTP vaccination (at 6 and 10 weeks for RV1 and 6, 10, and 14 weeks for RV5) (Mwenda *et al.* 2017).

Rotavirus vaccines are currently in widespread use worldwide and have had a proven influence on the burden of illness (Burnett E *et al*. 2017).

Despite this, there are still prospects for expansion in worldwide coverage. In order to address global rotavirus vaccine supply restrictions (Steele AD *et al.* 2019).

The spread and effectiveness of rotavirus immunization programs have been among the fastest ever. The rotavirus vaccine is now available in 95 countries, including 45 Gavi-eligible countries that have received financial assistance from the Gavi Alliance. Since its emergence, rotavirus disease and hospitalization have declined in countries that have accepted vaccines, including high-income and upper-middle-income countries (UMIC) (Karafillakisa E *et al*. 2015).

Furthermore, according to national studies, rotavirus vaccinations have reduced diarrhea-related mortality by 35% in Mexico and 22% in Brazil (Richardson V *et al*. 2011).

2.5. Vaccine storage and handling

Immunization is one of the most effective and cost-efficient public health treatments, saving two to three million lives annually. (UNICEF, 2016). On the other hand, national vaccination programs continue to have delivery hurdles in terms of sustainably decreasing the immunization coverage gap, introducing new vaccines, and ensuring long-term financial support. In order to overcome some of these issues, cold chain and logistical procedures for vaccines must be in place (Zaffran *et al.* 2013).

The "cold chain" refers to the method for shipping and storing vaccines at temperatures within the authorized range from manufacturing to the point of distribution. It has three main components: personnel, equipment, and procedures; the three components previously stated work together to guarantee proper vaccination delivery, storage, and handling. The ideal temperature range for refrigerated vaccines is between 2 and 8 degrees Celsius. For frozen vaccines, the ideal temperature is -15°C or lower; protection from light is required for some vaccinations to remain effective (Shastri 2019).

As a result, enhancing cold chain systems may enhance adequate vaccination coverage while lowering vaccine-preventable disease mortality (Ashok *et al*. 2017).

2.6. Routes of administration of several vaccines

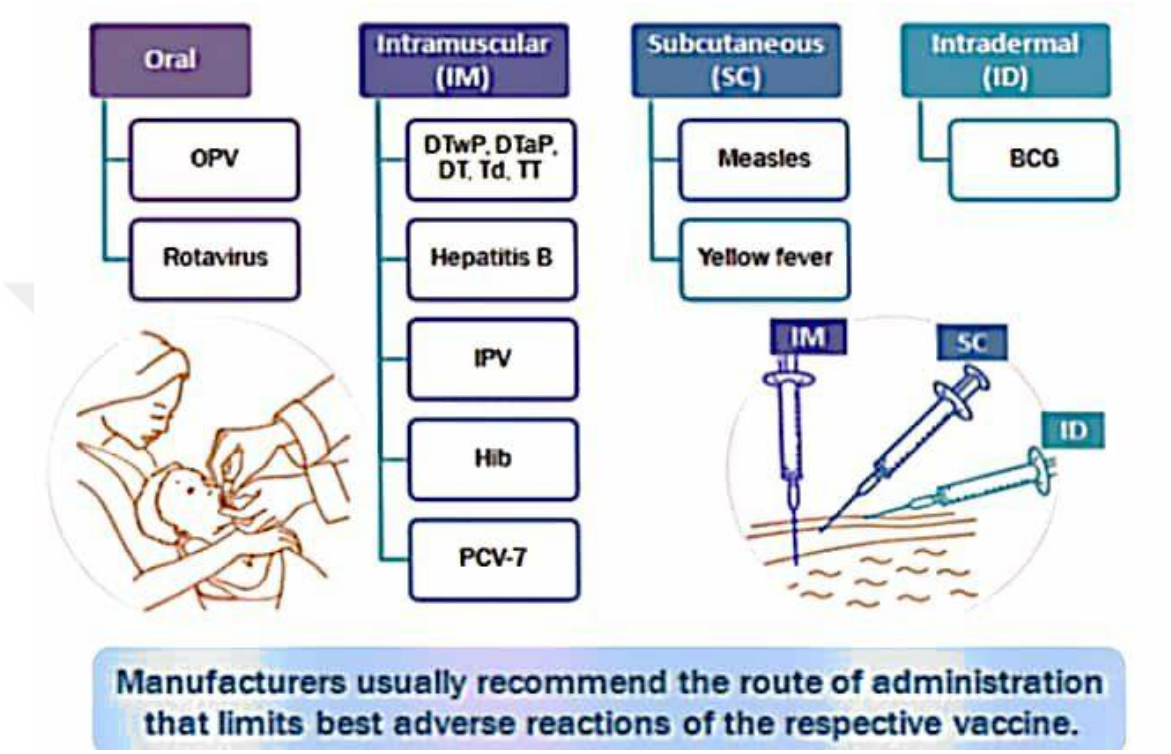

Figure 2.1 Routes of Administration (WHO MODULE 1² 2018)

2.7. Vaccine-Preventable Diseases

Since the introduction of EPI, vaccines for the prevention of additional illnesses have become available, and the World Health Organization has recommended that they be used worldwide. These vaccinations and vaccine additives protect against various diseases, including hepatitis B sickness, Pneumonia, and other H. influenzae type B and pneumococcal infections, as well as diarrhea caused by rotaviruses, are all common. Vaccines against illnesses such as yellow fever, for example, are recommended in places with a high prevalence of the disease (Mort *et al.* 2013).

Table 2.1 All of the EPI's vaccine-preventable diseases are listed here.

List	The disease	vaccine The
1	Tuberculosis (TB)	(BCG) vaccine
2	Poliovirus	A polio vaccination that may be taken orally (OPV)and polio virus that has been inactivated (IPV)
3	Diphtheria-causing Corynebacterium (Diphtheria)	Vaccine against diphtheria toxoid
4	Tetanus	Vaccine against Toxoid tetanus
5	Pertussis	Acellular (cell-free) pertussis (aP) vaccine and whole-cell pertussis (Wp) vaccine are two types of pertussis vaccination
6	The measles virus	The vaccine against measles
7	The hepatitis b virus	The vaccine against hepatitis b
8	The rotavirus	The vaccine against rotavirus
9	The Haemophilus influenza type b (Hib)	The vaccine against Haemophilus influenza
10	The pneumococcal infection	The vaccine against Pneumococcal
11	The yellow fever virus	The vaccine against Yellow

2.8. Adverse Events Following Immunization (AEFI)

Vaccination of children is one of the most cost-effective public health strategies available, avoiding 2–3 million lives annually through immunization (Sebastianet *et al.* 2019).

However, an estimated 21.8 million newborns worldwide are still missing out on essential immunizations (Yadav *et al*. 2021).

Vaccines are generally considered successful when provided to healthy people, including complete birth cohorts of newborns and large numbers (Plotkin, 2013). Vaccines administered as part of an extended immunization program (EPI) are considered safe and effective (Vashishtha *et al*. 2013).

No immunization is 100% safe, and adverse reactions can occur. Beyond the vaccines, the immunization technique might cause an unpleasant reaction in rare situations. An AEFI is a medical occurrence after vaccination but is not necessarily linked to the vaccine. An adverse or unexpected sign, abnormal test result, symptom, or illness. It can also be a disease. Adverse reactions to vaccines and immunizations might be actual or

coincidental, meaning they are not produced by the vaccine or immunization procedure but are temporally connected to vaccination (WHO Global manual 2014).

Cause-specific categorization was used to classify AEFI until 2012, when the WHO and the Council for International Organizations of Medical Sciences (CIOMS) changed it. (Table 2) (CIOMS 2012).

Table 2.2 Cause-specific categorization of AEFI

	Type of AEFI	Definition
1	reaction-related to vaccine product	refers to unpleasant effects that occur after vaccination and that are created or produced by the vaccine as a characteristics of result of one or more of the inherent the vaccine product
2	The reaction was caused by a flaw in the vaccine's quality	Acute adverse reactions following vaccination that are caused or prompted by the vaccine as a result of one or more quality problems with the vaccine product, including the company's administration equipment
3	Previously known as "program error," this response is caused by an immunization mistake	Unwanted adverse responses to vaccination that are induced or aggravated by improper vaccination prescription, administration, or handling
4	Immunization anxiety-related response	Adverse occurrences following vaccination that are triggered by concern over the vaccine
5	Accidental event	An unpleasant event following immunization is produced or precipitated by anything other than the vaccine itself, such as immunization anxiety or an immunization error resulting from the vaccination. A frequent issue that is regularly highlighted is a fever that comes at the time of immunization (temporal connection)

2.9. Mother knowledge

Sickness prevention is a fundamental goal in infant and child care (Kadhum *et al.* 2015).

Mothers worldwide are responsible for the feeding and care of their children, regardless of the resources or environment accessible to them. Therefore, knowledge of common

infections among mothers and caring for ill children contributes to their children's general health and well-being (Abbas *et al*. 2018).

The mother may be unaware of the dangers of not immunizing her kid if she does not have information about the situation. These illnesses are still prevalent today. Across the United States, mumps, measles, meningitis, and Pertussis (whooping cough) are reported. Those who travel bring the illness back from various places where it is prevalent. A youngster who has not been vaccinated continues to be at risk for severe and avoidable diseases (Atkinson *et al*. 2017).

2.10. Mother attitude

Disease prevention is essential. It is one of the most critical benefits every country may provide its citizens:n (Mugada *et al*. 2017).

It is undeniable that vaccinations are a vital component of any healthcare system (Wani *et al.* 2017).

In many nations across the globe, vaccination is an effective technique for disease prevention and control (Sunny *et al*. 2018).

along with the most cost-effective mortality and morbidity prevention method, individuals can better defend themselves against certain bacteria and viruses (Trushitkumar *et al.* 2017).

Children must obtain all their immunizations at the specified intervals and at the proper age to provide the best possible protection against disease (Chris-Otubor *et al.* 2015).

Vaccinating a kid with the necessary vaccinations would considerably lower the expenses of illness treatment and infection rates, improving the overall quality of the child's life (Fad *et al.* 2017).

Several research studies have reported on mothers' knowledge, attitudes, and practice (K.A.P.) towards children's immunization and demonstrated that effective vaccination depends on parents' positive attitude and expertise (Nisar *et al*. 2010).

Sickness outbreaks are caused by inadequate childhood vaccine uptake, primarily due to parental decisions to delay vaccination in industrialized countries. To identify evidence-based interferences, we comprehensively study the factors influencing parental vaccination decisions. A total of thirty-one studies were examined. The results and techniques vary, making them challenging to synthesize; nonetheless, it is consistently demonstrated that parents behave according to their opinions toward combination children vaccines. They think vaccines are dangerous and ineffective and that the diseases they protect against are mild and rare. They do not trust their health care providers, the government, or vaccine research that has been officially approved; they trust the media and non-official information sources and do not like feeling like they have to put their child's safety at risk for public health. Therefore, when interventions are used, they should focus on specific choice processes, such as disease-related expected regret and the perception that anecdotal information is statistically representative rather than comprehensive decision processes (Brown *et al.* 2010).

The lack of knowledge or information on vaccination, low awareness or unfavorable attitudes about vaccination, and misperceptions or rumors about vaccination safety are significant hurdles to achieving high vaccination coverage among children (Hu *et al*. 2016).

2.11. Mother practice

Parental behavior plays a vital role in decreasing the frequency of infectious diseases once the vaccination procedure is completed and completed. They practice vaccination related to the source of information regarding the vaccine, the number of sources available, and how parents obtained the vaccine information. Information provided by obstetric clinics, literature, the Internet, and the media covers the benefits of vaccination and the risks associated with V.P.D.s (Abbas *et al.* 2018).

Communication between parents and immunization providers or other sources of information is the most critical element affecting parental vaccination practices. Parents' opinions of the advantages and hazards of immunizations will improve due to improved communication (Vinish 2016).

Parents will be more likely to do so when continuing with their child's vaccine, albeit they may still be skeptical about immunizations. Parental consent to continue with their child's immunization may also be obtained; however, they may become subject to conflicting sources of information from anti-immunization proponents. However, this does not necessarily imply that parents have the knowledge and habits to provide informed consent before deciding to vaccinate their children. Previous studies discovered a statistically significant relationship between children's vaccination coverage and parental awareness and practice. This link indicated that there is a favorable relationship between these parameters. As a result, any improvement in parental understanding and actions will increase the coverage of children's immunizations (Al-lela *et al.* 2014).

3. METHODOLOGY

3.1. Design of the study

Descriptive cross-sectional study.

3.2. Time of study

The data collection was carried out during the three months commencing on January 1, 2022, and concluding on May 1, 2022.

3.3. Administrative arrangements

Before collecting the data, some administrative and official permissions were obtained to conduct the study.

1. The ethics committee approved the protocol for the study, the department of Institute of Health Sciences Department of Community Health Nursing \ Cankiri University \ Turkey, and the Iraq Ethics Committee also approved it **(Appendix 2, Appendix 3).**

2. The approval of the Training and Human Development Department in the Diwaniyah Health directorate was obtained to conduct the study.

3. The permission of the Diwaniyah sectors (first and second) was obtained to conduct the study in their primary health care centers.

3.4. Place of study

The study was carried out at twenty-four primary health care centers in AL-Diwanyah city/ Iraq.

AL-Diwanyah city Al-Diwaniyah is one of the cities in southern Iraq in the middle Euphrates area. It is the administrative, economic and political heart of Al-Diwaniyah Governorate, where all the administrative and governmental institutions are housed.

In 2020, the city's population estimations were 1291048 inhabitants .

The health care system contains two sectors with 24 primary health care centers in ALDiwanyah city.

Table 3.1 Multistage sampling from primary health sectors in AL-Diwanyah City.

Primary Health sectors	No. of all center	No. of study centers	%
First	**12**	**12**	**100%**
Second	**12**	**12**	**100%**
Total	**24**	**24**	**100%**

3.5. The Sample of the study

A non-probability sample "suitable" was selected from (390) mothers inside the vaccination unit at (24) primary healthcare centers in Al- Diwaniyah city in Iraq spread throughout (2) primary healthcare sectors, given in table 3.2.

Table 3.2 The PHCCs has taken randomly from AL-Diwanyah city, and the number of participants

The primary health care sector	Name of primary health care centers	NO. of visitors	No. of participant
First sector of Al-Diwaniyah	The First Al-Saneia	912	25
	The Second Al-Saneia	758	20
	The First Al Shafieia	772	21
	The Second Al Shaafieia	567	15
	Al-Jamia	613	16
	Al-Taliah	638	17
	Al-Hakim	418	11
	Algazaer	608	16
	Al-Urouba	411	11
	Alforat	643	17
	Algadidah	759	20
	Al-Taqiya	503	14
Second sector of Al-Diwaniyah	Al-Sadiq	513	14
	Al-Dagara	1107	30
	Al-Nahda	648	17
	First Al-Sader	579	16
	The second Al-Sader	504	14
	Third Al-Sader	588	16
	Fourth Al-Sader	517	14
	Al-Askan alsinaeiy	714	19
	Al-Shahed farhan	470	12
	Al-Gamhury	432	12
	Al- Zahra	408	11
	Al- Askan alqadim	426	12
Total	24	14499	390

3.6. The criteria for inclusion

1. Mothers attend the Primary Health Care Center (PHCC) in Al- Diwaniyah for immunization with their children from January 1 to April 1, 2022.

2. Mothers volunteer, regardless of their age.

3. Mothers with at least one child are eligible for the EPI program.

4. Mothers who attended Diwaniyah city health care centers and volunteered to participate.

3.7. The criteria for exclusion

1. Mothers who were asked to participate in the study did not provide their consent to do so.

2. Caregivers who were not the child's primary caregivers but looked after them.

3.8. The study instrument

The researcher used a questionnaire (Abbas *et al*. 2018)**.** The consent of the author

Then the questionnaire was presented to Four experts The questionnaire consisted of four parts as follows:

Part I: Socio-demographic Data

This part consists of two sections. These sections are presented as follows:

Section (A): Mothersʾ demographic data:

This section contains information about the mothers' age, level of education (which is divided into seven categories: read and write, primary, intermediate, secondary, institute, college, and postgraduate), occupation (which is divided into two types: employed and unemployed), residency, and the source of information about immunizations that they received.

Section (B): Childsʾ demographic data

This section includes the child's age, immunization status up to a generation, and reasons for partial immunization.

Part II: mothersʾ Knowledge of Immunization

This part comprises structured items concerning the mothers' knowledge of immunizations for children. It is consisted of (61) things and composed of thirteen sections are presented as follows:

Section (1): Knowledge about the concept of immunization. It is measured through 7 items.

Sections (2): Knowledge about the importance of immunization. It is measured through 7 items.

Section (3): Knowledge about vaccine reactions. It is measured through 6 items.

Section (4): Knowledge about routine immunization. It is measured through 5 items.

Section (5): Knowledge about contraindication of vaccination. The items were divided into two areas. Area 1:- The child can be given the vaccine in the following cases measured through 8 items. Area 2:- The child cannot be given the vaccines in the following instances measured through 5 items.

Section (6): Knowledge about BCG vaccine. It is measured through 4 items.

Section (7): Knowledge about the oral polio vaccine. It is measured through 4 items.

Section (8): Knowledge about Hepatitis B vaccine. It is measured through 3 items.

Section (9): Knowledge about (diphtheria, tetanus, and pertussis) vaccine. It is measured through 2 items.

Section (10): Knowledge about measles. It is measured through 2 items.

Section (11): Knowledge about measles, mumps, and rubella. It is measured through 2 items.

Section (12): Knowledge about Haemophilus influenza type b vaccine. It is measured through 2 items.

Section (13): Knowledge about the Rotavirus vaccine. It is measured through 4 items.

Part III: Mothers' Attitudes toward Immunization

This section contains structured items about mothers' attitudes on the immunization of children. It is made up of (22) different things and is divided into three divisions, which are as follows:

Section (1): Attitudes about the importance of vaccination. It is measured through (9) items.

Section (2): Attitudes about routine immunization. It is measured through (6) items.

Section (3): Attitudes about immunization side effects. It is measured through (7) items.

Part IIII: Mothers' Practices toward Immunization

This section contains structured items about moms' vaccine practices for their children. It is made up of (19) different things and is divided into four sections, which are as follows:

Section (1): Practices about routine immunization measured through (8) items.

Section (2): Practices about BCG scare. It is measured through (2) items.

Section (3): Practices on monitoring the side effects of immunization. It is measured through (5) items.

Section (4): Practices about care for immunization side effects. It is measured through (4) items.

3.9. Validity of the questionnaire

It was determined that the study tool (the questionnaire) was legitimate by consulting with a group of specialists. Twelve experts from various disciplines were asked to examine and assess a draft of the questionnaire to ensure that its substance, clarity, applicability, and efficiency were appropriate for achieving the goals of the current study(Appendix 4). While the vast majority felt that the questionnaire was straightforward and sufficient in its content, they suggested minor adjustments to a few sections. Therefore, all expert views have been considered for review and modification.

3.10. The pilot study

Pilot research is conducted before data collection to determine the study instrument's reliability. It was done in Al-Diwaniyah city training primary health care center from 12th to 14th December 2021, on a pilot sample that consisted of 39 mothers who were excluded from an original example of the study.

The study tries to accomplish the following objectives:

The study attempts to achieve the following goals:

A. Examine the validity and reliability of the study instrument to decide.

B. Estimating the time required for each interview between the researcher and the target sample.

C. Determining the obstacles that the study may face throughout the study period.

D. Knowing how smooth the contents of the study tool are and their suitability for the target sample and adequacy.

The result of the pilot study:

A. The questionnaire's features are apparent, simple to comprehend, and ideal for assessing mothers' knowledge, attitudes, and actions about the national vaccination program.

B. Some minor changes were made to a few items in the questionnaire.

C. The average time necessary for each interview was roughly (15-20) minutes per mother.

D. The validity and reliability of the research instrument have been verified.

3.11. Reliability of the study instrument

The information was acquired from (39) moms who participated in the study to determine the reliability of the questionnaire. In addition, Cronbach's alpha correlation coefficient was used to assess the reliability of the study instrument's internal consistency dependability. To calculate the reliability estimate, all (39) data points were input into SPSS version 20.

Table 3.3 Reliability coefficients of the study instrument.

Questionnaires	Items	Cronbach's Alpha
Knowledge	61	.958
Attitudes	22	.864
Practices	19	.780

According to the table above, the questionnaire has a high Cronbach's Alpha value and a high acceptability level of reliability. The computed findings show that the created questionnaire is valid for examining the phenomena in the same population at any point in the future (Polit et al., 2013).

3.12. Method of data collection

Face-to-face interviews were used to obtain the information for this study, and the results were positive. Interviews were performed with women who attended primary healthcare centers in Al-Diwaniyah City between February 1, 2022, and April 1, 2022. They completed a questionnaire after authorization was obtained from the primary healthcare sector. The moms consented to participate in the interview; most mothers went to the primary health care facility in the morning to get their children checked. The researcher provided this information while he was in the immunization unit. The average time necessary for each mother respondent has taken around 15-20 minutes for the whole questionnaire.

3.13. The data analysis methods

Version 2 0of the Statistical Package for the Social Sciences (SPSS) application statistical analysis system is used to analyze the data collected for this research. It was conducted using the statistical data analysis methodologies as an additional measure of analysis and evaluation of the study's findings.

3.14. Methods of statistic

In order to analyze the data that was gathered for the study, the Statistical Package for the Social Sciences, version 20, and Microsoft Excel (2010) were utilized.

3.14.1. Descriptive approach

A. Statistical tables "Frequencies and percent" which are:

$$\% = \frac{\boldsymbol{Frequency}}{\boldsymbol{Sample\ Size}}\ x100$$

B. Mean of scores "M.s.."

The average score can be calculated by using the following:

$$M.S = \frac{\sum \text{ri} = 1\text{Fi x Si}}{\sum \text{ri} = 1\text{Fi}}\ x100$$

C. The test of standard deviation "S.d.."

$$\text{Standard deviation} = \sqrt{\frac{\sum(X - \bar{X})^2}{n-1}}$$

D. It uses a correlational coefficient "Cronbach alpha" used in estimating the internal consistency of the study tool, which can be calculated by using the following:

$$\alpha = \frac{K}{K-1}\left[1 - \frac{\sum_{i=1}^{K}\sigma_{ii}}{\sum_{i=1}^{K}\sum_{j=1}^{K}\sigma_{ij}}\right]$$

"K is the items number questions."

"σ_{ij} is the investigate covariance between the items"

"i and j. Note the σ_{ii} is the variance not the standard deviation of item I"

3.14.2. Inferential approach

1. t-test

❖ **Independent t-test**

To assess the significant difference between overall and demographic characteristics.

2. One Way ANOVA

Analysis of variance (ANOVA) to determine whether or not the means are equal (trying to see whether or not the parameters of the means are coincidental).

Source of variance	Sum of square	d.f	Mean square	F
Between Groups	$SS_B = \sum \frac{(\sum xP1)^2}{n} - \frac{(\sum xP)^2}{n}$	$df_B = K\text{-}1$	$\frac{MS\beta}{MS\beta}$	$\frac{MSB}{MSW}$
Within Groups	$SS_W = \sum (\sum xP1)^2 - \frac{(\sum xP)^2}{N}$	$df_w = N\text{-}k$	$\frac{SSw}{DFw}$	
Total	$SS_T = \sum (\sum xP1)^2 - \frac{(\sum xP)^2}{N}$	$df_1 = N\text{-}1$		

Shortcuts for measuring importance compared to the level are used as follows:

(1) **NS**: *Nonsignificant when probability > 0.05*.

(2) **S**: *Significantly when the probability is less than 0.05*.

4. RESULTS OF THE STUDY

This chapter introduces research results in tables, which correspond to the study's objectives:

Table 4.1 Descriptive statistic of socio-demographic characteristic of the study sample.

Demographic Data	Groups	Freq.	%
Age	less than 20	66	16.9
	20 to 25	128	32.8
	Equal or more than 26	196	50.3
	Total	390	100.0
level education	Read and write	49	12.6
	Primary	129	33.0
	Intermediate	42	10.8
	Secondary	39	10.0
	Institute	40	10.3
	College	77	19.7
	Postgraduate	14	3.6
	Total	390	100.0
Occupation	Employed	138	35.4
	Unemployed	252	64.6
	Total	390	100.0
Residence	Urban	242	62.1
	Rural	148	37.9
	Total	390	100.0
Source of information about immunization	TV	47	12.1
	Social media	68	17.4
	Health institutions	217	55.6
	Parents, relatives, and Friends	58	14.9
	Total	390	100.0
child's age	Newborn	58	14.9
	Infancy	210	53.8
	Toddler	70	17.9
	Preschool	52	13.3
	Total	390	100.0
Immunization status	Complete immunization	152	39.0
	Partial immunization	238	61.0
	Total	390	100.0
Reasons for partial immunization	Distance from PHC center	9	2.3
	Unavailability of vaccine	28	7.2
	Fear of side effects	18	4.6
	Lack of information	22	5.6
	Forget to go for a repeated dose	6	1.5
	Mother was sick	33	8.5
	Child was sick	79	20.3
	Dissatisfaction with the vaccine	10	2.6
	Others	33	8.5
	Total	238	61.0

This table shows sociodemographic information on mothers in frequencies and percentages. In this research of 390 mothers, 50.3% were over 26 years old. Educated mothers at the primary level constitute (33.0 percent). According to the survey, most mothers were unemployed. Urban dwellings make up more than half compared to rural dwellings (62.1%). Most of the research sample (55.6%) obtained vaccination information from health facilities. As for the child's age, more than half of the sample was in Infancy (53.8%). (61%) of the children were partially vaccinated, and the reason for this was that the child was sick, constituting 20.3% of the study's total sample.

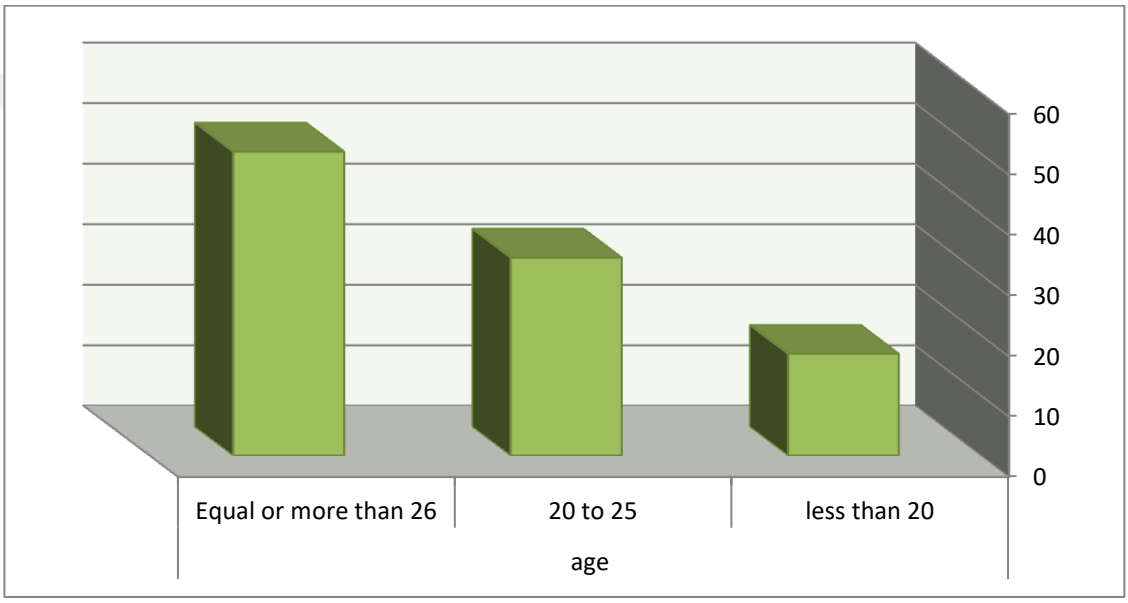

Figure 4.1 Distribution of study sample by their age.

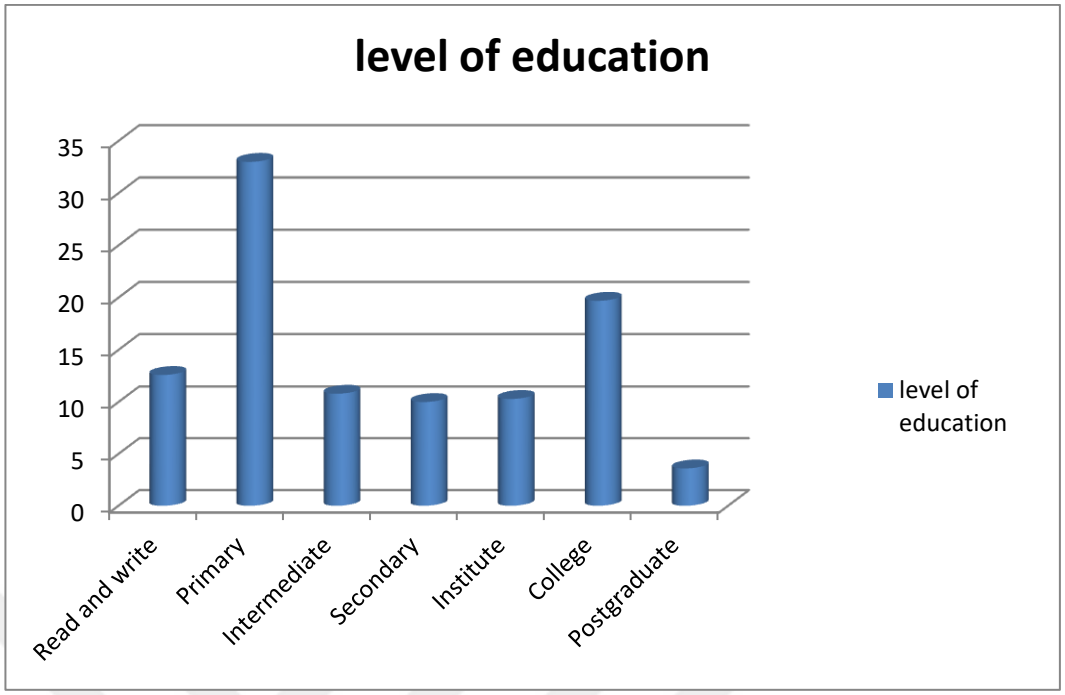

Figure 4.2 Distribution of study sample by their level of education.

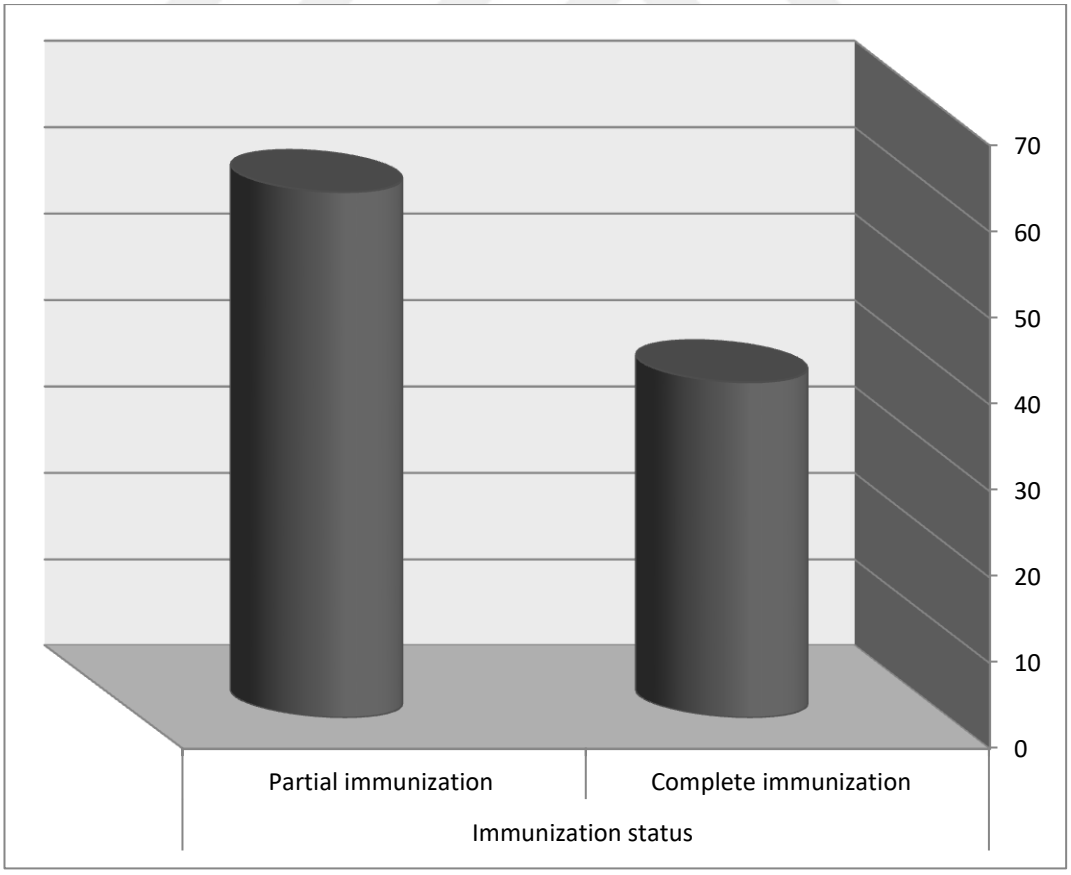

Figure 4.3 Distribution of study sample by their immunization status.

Table 4.2 Mother's knowledge responses regarding the immunization of children

List	Items	Rating	Frequency	Percent	Mean	SD.
	Knowledge about the concept of immunization					
1	Immunization is the process of stimulating the immune system to produce antibodies against diseases	do not know	251	64.4	1.63	.884
		Uncertain	32	8.2		
		Know	106	27.2		
		Total	390	100.0		
2	Vaccines are recommended for children of <6 years.	don't know	262	67.2	1.56	.843
		Uncertain	38	9.7		
		Know	90	23.1		
		Total	390	100.0		
3	If you forget to give your kid one or more of their vaccinations, you should get them when you take them for their next appointment.	do not know	274	70.3	1.52	.838
		Uncertain	28	7.2		
		Know	88	22.6		
		Total	390	100.0		
4	If the kid experiences a severe adverse response after receiving a previous dosage of the vaccine, the child may be exempt from further vaccinations.	do not know	254	65.1	1.61	.871
		Uncertain	35	9.0		
		Know	101	25.9		
		Total	390	100.0		
5	Combination vaccinations are often utilized to boost the overall efficacy of the vaccine.	do not know	247	63.3	1.64	.879
		Uncertain	38	9.7		
		Know	105	26.9		
		Total	390	100.0		
6	no substantial link between vaccination and delayed growth and development.	do not know	283	72.6	1.46	.794
		Uncertain	33	8.5		
		Know	74	18.9		
		Total	390	100.0		
7	sickness does not prevent the child from tolerating the vaccine	do not know	278	71.3	1.52	.841
		Uncertain	23	5.9		
		Know	89	22.8		
		Total	390	100.0		
	Knowledge about the importance of immunization					
8	Protect the child from infectious disease	do not know	259	66.4	1.65	.930
		Uncertain	7	1.8		
		Know	124	31.8		
		Total	390	100.0		
9	Maintain child health	don't know	272	69.7	1.57	.889
		Uncertain	12	3.1		
		Know	106	27.2		
		Total	390	100.0		
10	Reduce child mortality and disability	don't know	237	60.8	1.68	.896
		Uncertain	39	10		
		Know	114	29.2		
		Total	390	100.0		
11	Protect children from disease complication	don't know	253	64.9	1.61	.873
		Uncertain	35	9.0		
		Know	102	26.1		
		Total	390	100.0		

Table 4.2 (Continue): Mother's knowledge responses regarding the immunization of children

12	Children are protected from the illnesses they are vaccinated against during their first year.	do not know	262	67.2	1.60	.889
		Uncertain	21	5.4		
		Know	107	27.4		
		Total	390	100.0		
13	Prevention of life-threatening diseases	don't know	265	67.9	1.61	.900
		Uncertain	14	3.6		
		Know	111	28.5		
		Total	390	100.0		
14	Immunization protects the child's life up to ten years old	do not know	272	69.7	1.55	.864
		Uncertain	21	5.4		
		Know	97	24.9		
		Total	390	100.0		
	Knowledge about vaccines reactions					
15	minor reactions Usually occur within a few hours of giving the vaccine	do not know	260	66.7	1.61	.886
		Uncertain	24	6.2		
		Know	106	27.1		
		Total	390	100.0		
16	Minor reactions do not pose a threat to a child's life	do not know	247	63.3	1.68	.922
		Uncertain	20	5.2		
		Know	123	31.5		
		Total	390	100.0		
17	Pain, swelling, or redness at the injection site are some mild local responses.	do not know	258	66.1	1.66	.932
		Uncertain	7	1.8		
		Know	125	32.1		
		Total	390	100.0		
18	General side effects of vaccines include fever, malaise, and loss of appetite)	do not know	253	64.9	1.65	.906
		Uncertain	22	5.6		
		Know	115	29.5		
		Total	390	100.0		
19	Severe reactions Usually do not result in long-term problems	do not know	252	64.6	1.66	.913
		Uncertain	20	5.1		
		Know	118	30.3		
		Total	390	100.0		
20	Severe reactions include seizures and allergies caused by the body's response to a particular ingredient in a vaccine.	do not know	244	62,6	1.70	.931
		Uncertain	18	4.6		
		Know	128	32.8		
		Total	390	100.0		
	Knowledge about routine immunization					
21	The infant should start a vaccination program after birth	do not know	197	50.5	1.79	.868
		Uncertain	79	20.3		
		Know	114	29.2		
		Total	390	100.0		
22	Vaccination given for free by government	don't know	3	0.8	2.98	.189
		Uncertain	2	0.5		
		Know	385	98.7		
		Total	390	100.0		

Table 4.2 (Continue): Mother's knowledge responses regarding the immunization of children

23	In order to build up the children's immunity, many doses of the vaccine were administered at regular intervals.	do not know	205	52.6	1.71	.819
		Uncertain	95	24.4		
		Know	90	23.0		
		Total	390	100.0		
24	Giving more than one vaccine at the same time increases the child's immunity and does not affect it negatively	do not know	222	56.9	1.64	.808
		Uncertain	86	22.1		
		Know	82	21.0		
		Total	390	100.0		
25	National vaccination campaigns are not a substitute for routine vaccinations at health centers	don't know	209	53.6	1.69	.819
		Uncertain	92	23.6		
		Know	89	22.8		
		Total	390	100.0		
	Knowledge about contraindication of immunization is divided into:					
A	**The child can be given the vaccine in the following cases:**					
26	Malnutrition	do not know	216	55.4	1.73	.879
		Uncertain	62	15.9		
		Know	112	28.7		
		Total	390	100.0		
27	Diarrhea	don't know	242	62.0	1.62	.843
		Uncertain	56	14.4		
		Know	92	23.6		
		Total	390	100.0		
28	Seasonal flu	don't know	234	60.0	1.59	.792
		Uncertain	81	20.8		
		Know	75	19.2		
		Total	390	100.0		
29	Vomiting	don't know	252	64.6	1.57	.829
		Uncertain	52	13.3		
		Know	86	22.1		
		Total	390	100.0		
30	Allergy	don't know	246	63.1	1.61	.844
		Uncertain	52	13.3		
		Know	92	23.6		
		Total	390	100.0		
31	Common cold	don't know	220	56.4	1.69	.848
		Uncertain	72	18.5		
		Know	98	25.1		
		Total	390	100.0		
32	Otitis media	do not know	239	61.3	1.63	.850
		Uncertain	56	14.4		
		Know	95	24.4		
		Total	390	100.0		
33	Jaundice	don't know	240	61.5	1.61	.831
		Uncertain	62	15.9		
		Know	88	22.6		
		Total	390	100.0		

Table 4.2 (Continue): Mother's knowledge responses regarding the immunization of children

B	The child cannot be given the vaccine in the following cases:					
34	Immunological disease	do not know	252	64.6	1.59	.843
		Uncertain	47	12.1		
		Know	91	23.3		
		Total	390	100.0		
35	Previous severe allergic reaction after immunization	do not know	157	40.3	2.1	.903
		Uncertain	73	18.7		
		Know	160	41.0		
		Total	390	100.0		
36	HIV Infection	don't know	246	63.1	1.60	.839
		Uncertain	54	13.8		
		Know	90	23.1		
		Total	390	100.0		
37	Neurological disorders	don't know	275	70.5	1.50	.814
		Uncertain	35	9.0		
		Know	80	20.5		
		Total	390	100.0		
38	Severe fever	do not know	220	56.4	1.74	.897
		Uncertain	51	13.1		
		Know	119	30.5		
		Total	390	100.0		
	Knowledge about the BCG vaccine					
39	Prevent tuberculosis	do not know	232	59.5	1.70	.895
		Uncertain	43	11.0		
		Know	115	29.5		
		Total	390	100.0		
40	It is given to newborns during the first week of their life.	do not know	202	51.8	1.83	.918
		Uncertain	51	13.1		
		Know	137	35.1		
		Total	390	100.0		
41	After a week or several weeks, a scar will develop at the place where the BCG vaccine was injected.	do not know	155	39.7	2.6	.925
		Uncertain	56	14.4		
		Know	179	45.9		
		Total	390	100.0		
42	The BCG vaccine is not given to thechild after the completion of the first year of life, even if a previous dose is not taken	do not know	231	59.2	1.73	.917
		Uncertain	34	8.7		
		Know	125	32.1		
		Total	390	100.0		
	Knowledge about oral polio vaccine					
43	Is the vaccine that prevents poliomyelitis	do not know	142	36.4	2.17	.935
		Uncertain	38	9.7		
		Know	210	53.8		
		Total	390	100		
44	In the first week of life, a zero dose of the polio vaccination is given	do not know	237	60.8	1.58	.844
		Uncertain	35	8.9		
		Know	118	30.3		
		Total	390	100		

Table 4.2 (Continue): Mother's knowledge responses regarding the immunization of children

Table 4.2 (Continue): Mother's knowledge responses regarding the immunization of children

45	Do not breastfeed the baby (20-30 minutes) after the oral vaccine	don't know	255	65.4	1.69	.905
		Uncertain	44	11.3		
		Know	91	23.3		
		Total	390	100		
46	The vaccination regimen calls for six doses of OPV for a 6-year-old.	do not know	259	66.4	1.55	.819
		Uncertain	49	12.6		
		Know	82	21.0		
		Total	390	100		
	Knowledge about the Hepatitis B vaccine					
47	A vaccine can prevent hepatitis B	don't know	102	26.2	2.35	.868
		Uncertain	48	12.3		
		Know	240	61.5		
		Total	390	100		
48	The first dose of hepatitis B is given within)24 hours(of the child's age	do not know	253	64.9	1.59	.852
		Uncertain	43	11		
		Know	94	24.1		
		Total	390	100		
49	Six doses of Hepatitis B Vaccine are required before six years of age	do not know	275	70.5	1.48	.784
		Uncertain	44	11.3		
		Know	71	18.2		
		Total	390	100		
	Knowledge about (diphtheria, tetanus, pertussis) vaccine					
50	It is a vaccine that prevents diphtheria, tetanus, pertussis	do not know	135	34.6	2.17	.916
		Uncertain	52	13.3		
		Know	203	52.1		
		Total	390	100		
51	The DTP vaccination is administered at 2, 4, 6, and 18 months of age, as well as between the ages of 4 and 6 years	do not know	227	58.2	1.72	.895
		Uncertain	47	12.1		
		Know	116	29.7		
		Total	390	100		
	Knowledge about measles					
52	It is a vaccine that prevents measles	do not know	131	33.6	2.23	.921
		Uncertain	40	10.2		
		Know	219	56.2		
		Total	390	100		
53	The age at which the measles vaccination is administered is nine months	do not know	225	57.6	1.78	.946
		Uncertain	24	6.2		
		Know	141	36.2		
		Total	390	100		
	Knowledge about measles, mumps, rubella					
54	It is a vaccine that prevents measles, mumps, rubella	do not know	144	36.9	2.12	.921
		Uncertain	54	13.9		
		Know	192	49.2		
		Total	390	100		
55	MMR is given at the age of 15 months and 4– 6 years	do not know	233	59.7	1.72	.916
		Uncertain	33	8.5		
		Know	124	31.8		
		Total	390	100		

Table 4.2 (Continue): Mother's knowledge responses regarding the immunization of children

	Knowledge about Haemophilus influenza type b vaccine					
56	The Hib vaccine can prevent meningitis and pneumonia	do not know	257	65.9	1.61	.882
		Uncertain	28	7.2		
		Know	105	26.9		
		Total	390	100		
57	Four doses of the Hib vaccine are required for children under six years	do not know	277	71.0	1.52	.838
		Uncertain	25	6.4		
		Know	88	22.6		
		Total	390	100		
	Knowledge about the Rotavirus vaccine					
58	Rotavirus vaccine is available to prevent diarrhea	do not know	295	75.6	1.41	.752
		Uncertain	32	8.2		
		Know	63	16.2		
		Total	390	100		
59	Three doses of the Rotavirus vaccine are required before six years of age	do not know	318	81.5	1.32	.705
		Uncertain	18	4.6		
		Know	54	13.8		
		Total	390	100		
60	The rotavirus virus is not given to the child if he is over three months old and vaccination has not been initiated	do not know	316	81.0	1.32	.689
		Uncertain	24	6.2		
		Know	50	12.8		
		Total	390	100		
61	The rotavirus vaccine is not given to the child after the age of eight months, even if he does not complete the prescribed dose	do not know	274	70.3	1.45	.756
		Uncertain	53	13.6		
		Know	63	16.1		
		Total	390			

N (390), cut-off point (0.66), do not know (mean of score 1-1.66), Uncertain (mean of scores (1.67-2.33) and Know (mean of score 2.34-3).

Findings assessed research sample answers on child vaccinations; The bulk of questionnaire items (60.6%) did not know, while 36.4% knew and 3% were uncertain.

Table 4.3 Mother's knowledge responses regarding the overall immunization of children.

Items	Rating	Frequency	Percent	Mean	SD.
Overall mothers assessment	do not know	229	58.7	1.65	.852
	Uncertain	63	16.2		
	Know	98	25.1		
	Total	390	100.0		

N (390), cut-off point (0.66), do not know (mean of score 1-1.66), Uncertain (mean of scores (1.67-2.33), and Know (mean of score 2.34-3).

Findings illustrated that the (58.7%) of moms said they did not know, (25.1%) said they did, and (16.2%) were unsure.

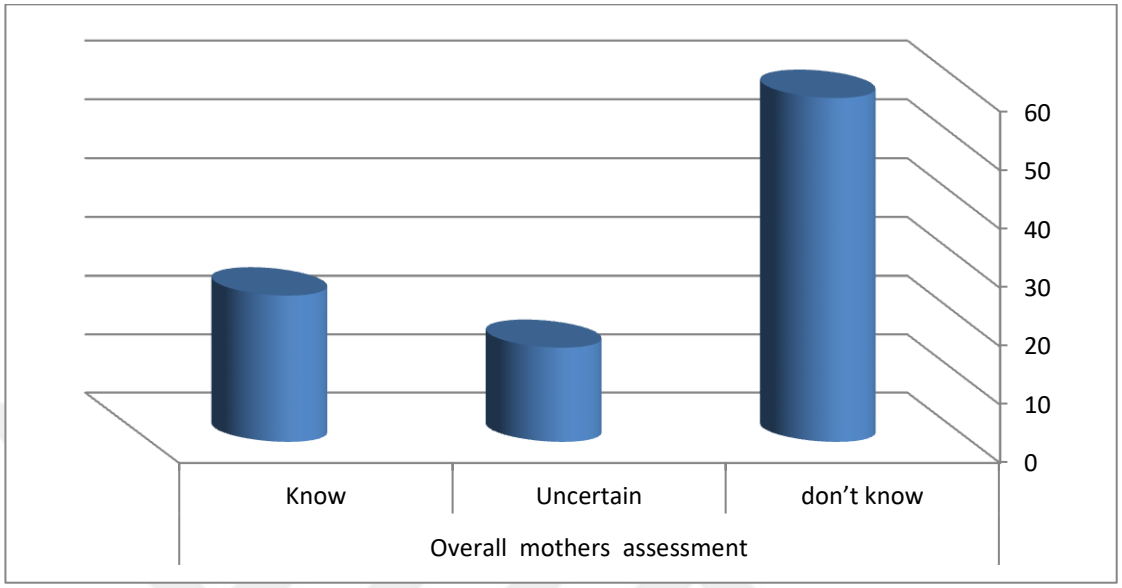

Figure 4.4 Distribution of study sample by their overall assessment regarding immunization of children.

Table 4.4 Mother's attitude to the immunization of children.

List	Items	Rating	Frequency	Percent	Mean	SD.
	Attitudes about the importance of vaccination					
	Positive attitudes					
1	I think vaccines for child immunization are safe	Agree	257	65.9	2.32	944.
		Uncertain	2	0.5		
		Disagree	131	33.6		
		Total	390	100.0		
2	I think the benefits of vaccinations exceed their harm	Agree	272	69.7	2.40	.914
		Uncertain	2	0.5		
		Disagree	116	29.7		
		Total	390	100.0		
3	I have a preference for immunization because it maintains a child's health	Agree	299	76.7	2.55	. 824
		Uncertain	7	1.8		
		Disagree	84	21.5		
		Total	390	100.0		
4	They were the best for each child	Agree	302	77.4	2.56	. 817
		Uncertain	6	1.5		
		Disagree	82	21.0		
		Total	390	100.0		
5	I prefer immunization because it saves the community	Agree	254	65.1	2.50	. 740
		Uncertain	78	20.0		
		Disagree	58	14.9		
		Total	390	100.0		

Table 4.4 (Continue): Mother's attitude to the immunization of children.

6	I prefer immunization because it reduces the mortality rate	Agree	291	74.6	2.57	. 764
		Uncertain	32	8.5		
		Disagree	66	16.9		
		Total	390	100.0		
7	I prefer immunization because it effective in the prevention of infectious diseases	Agree	297	76.2	2.55	. 818
		Uncertain	11	2.8		
		Disagree	82	21.0		
		Total	390	100.0		
	Negative attitudes					
8	I think the tetanus vaccine is not essential for infant and mother health	Agree	137	35.1	2.29	. 954
		Uncertain	2	0.5		
		Disagree	251	64.4		
		Total	390	100.0		
9	I think vaccination is more important for boys than girls	Agree	118	30.3	2.39	. 919
		Uncertain	0	0.0		
		Disagree	272	69.7		
		Total	390	100.0		
	Attitudes about routine immunization					
	Positive attitudes					
10	I prefer vaccination must give according to the schedule	Agree	330	84.6	2.70	. 709
		Uncertain	3	0.8		
		Disagree	57	14.6		
		Total	390	100.0		
11	A child who has been treated or is under treatment by a traditional healer should still receive immunization	Agree	311	79.7	**2.59**	. 801
		Uncertain	1	0.3		
		Disagree	78	20.0		
		Total	390	100.0		
12	It is best to be aware of the vaccine by health care workers before the child receives it	Agree	306	78.5	2.57	. 813
		Uncertain	3	0.8		
		Disagree	81	20.8		
		Total	390	100.0		
	Negative attitudes					
13	I will not take my child for immunization because he was not sick	Agree	123	31.6	2.36	. 929
		Uncertain	2	0.5		
		Disagree	265	67.9		
		Total	390	100.0		
14	I need the permission of my husband to take my child for immunization	Agree	112	28.7	2.42	. 905
		Uncertain	2	0.5		
		Disagree	276	70.8		
		Total	390	100.0		
15	Better go to my work is more important to me than taking a child to a health facility for immunization	Agree	110	28.2	2.42	.949 .
		Uncertain	3	0.8		
		Disagree	277	71.0		
		Total	390	100.0		

Table 4.4 (Continue): Mother's attitude to the immunization of children.

	Attitudes about immunization side effects					
	Positive attitudes					
16	I think vaccination is not harmful	Agree	348	89.2	2.78	.615
		Uncertain	1	0.3		
		Disagree	41	10.5		
		Total	390	100.0		
17	I suppose that the vaccine gives immunity to children against infectious diseases	Agree	331	84.8	2.70	.704
		Uncertain	3	0.8		
		Disagree	56	14.4		
		Total	390	100.0		
18	I think the child does not get infected after the vaccination	Agree	307	78.7	2.57	.812
		Uncertain	2	0.5		
		Disagree	81	20.8		
		Total	390	100.0		
	Negative attitudes					
19	I predict immunization has serious side effects	Agree	146	37.5	2.23	.965
		Uncertain	6	1.5		
		Disagree	238	61.0		
		Total	390	100.0		
20	I guess the side effects cause death	Agree	143	36.7	2.25	.834
		Uncertain	6	1.5		
		Disagree	241	61.8		
		Total	390	100.0		
21	I think the vaccine makes children with the disease	Agree	148	37.9	2.22	. 968
		Uncertain	5	1 .3		
		Disagree	237	60.8		
		Total	390	100.0		
22	I think that after immunization, the child will get the disease that has been vaccinated against him	Agree	154	39.5	2.18	.971
		Uncertain	9	2.3		
		Disagree	227	58.2		
		Total	390	100.0		

N (390), cut-off point (0.66), Disagree (mean of score 1-1.66), Uncertain (mean of scores (1.67-2.33), and Agree (mean of score 2.34-3).

The results showed the following, 68% of the respondents agreed with the answers, while 32% disagreed with the answers.

Table 4.5 Mother's attitude to the overall immunization of children.

Items	Rating	Frequency	Percent	Mean	SD.
Overall mothers attitude	Disagree	2	0.5	2.4645	.41271
	Uncertain	170	43.6		
	Agree	218	55.9		
	Total	390	100.0		

N (390), cut-off point (0.66), Disagree (mean of score 1-1.66), Uncertain (mean of scores (1.67-2.33), and Agree (mean of score 2.34-3.

Findings illustrated that (55.9%) of moms agreed with replies, (43.6%) were unsure, and (0.5%) disagreed.

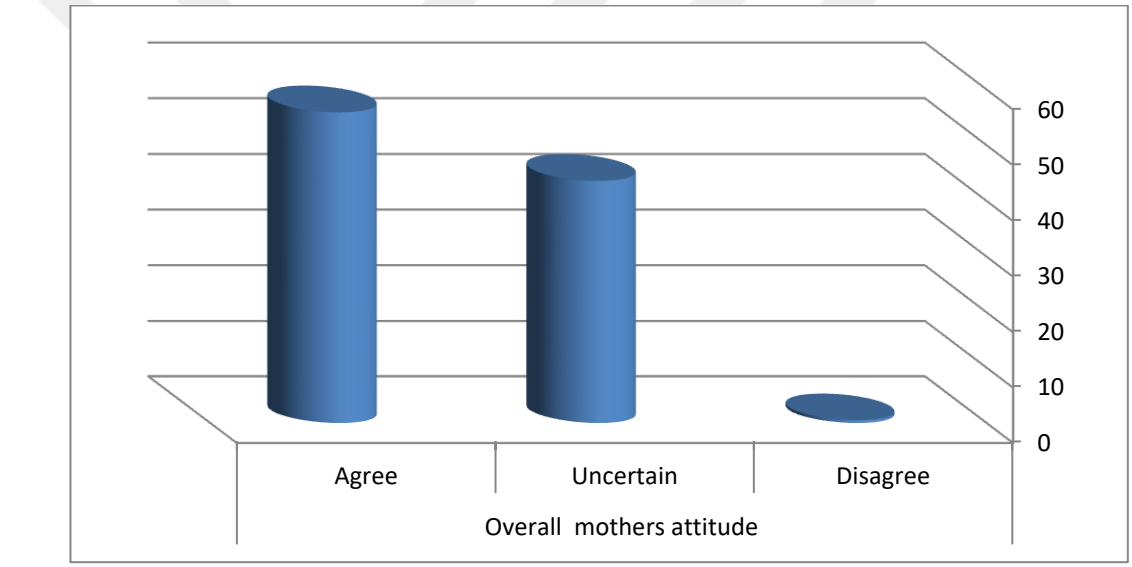

Figure 4.5 Distribution of study sample by their overall attitude regarding immunization of children.

Table 4.6 Mother's practices toward the immunization of children.

	Items	Rating	Frequency	Percent	Mean	SD.
	Practices about routine immunization					
1	I know when is the next vaccination date for the child	Never	256	65.6	1.57	.841
		Sometime	44	11.3		
		Always	90	23.1		
		Total	390	100.0		
2	I keep the vaccination document	Never	222	56.9	1.73	.892
		Sometime	52	13.4		
		Always	116	29.7		
		Total	390	100.0		
3	I maintain that the child takes the hepatitis B vaccine within 24 hours after birth	Never	262	67.2	1.59	.878
		Sometime	25	6.4		
		Always	103	26.4		
		Total	390	100.0		
4	I recommend others to vaccinate their children	Never	270	69.2	1.53	.832
		Sometime	34	8.7		
		Always	86	22.1		
		Total	390	100.0		
5	I ask the healthcare provider about each vaccine the child receives	Never	277	71.1	1.45	.749
		Sometime	52	13.3		
		Always	61	15.6		
		Total	390	100.0		
6	My child receives the vaccine according to the vaccination schedule	Never	269	69	1.54	.841
		Sometime	32	8.2		
		Always	89	22.8		
		Total	390	100.0		
7	I have finished immunization for my child according to the s	Never	251	64.4	1.56	.814
		Sometime	58	14.9		
		Always	81	20.8		
		Total	390	100.0		
8	I adhere tetanus toxoid vaccination taken during pregnancy	Never	238	61.1	1.61	.825
		Sometime	66	16.9		
		Always	86	22.0		
		Total	390	100.0		
	Practices about BCG scare					
9	The BCG vaccine left arm	Never	259	66.4	1.55	.819
		Sometime	49	12.6		
		Always	82	21.0		
		Total	390	100.0		

Table 4.6 (Continue): Mother's practices toward the immunization of children.

10	Scarring does not appear at the injection site 90 days after giving the vaccine. T he the best decision is repetition	Never	250	64.1	1.61	.856
		Sometime	44	11.3		
		Always	96	24.6		
		Total	390	100.0		
	Practices about monitoring the side effects of immunization					
11	High temperature	Never	207	53.1	1.84	.936
		Sometime	39	10.0		
		Always	144	36.9		
		Total	390	100.0		
12	Rash	Never	257	65.9	1.58	.853
		Sometime	39	10.0		
		Always	94	24.1		
		Total	390	100.0		
13	Redness at the site of injection	Never	246	63.1	1.60	.836
		Sometime	55	14.1		
		Always	89	22.8		
		Total	390	100.0		
14	Swelling at the site of injection	Never	243	62.3	1.64	.869
		Sometime	45	11.5		
		Always	102	26.2		
		Total	390	100.0		
15	Pain at the site of injection	Never	229	58.7	1.71	.894
		Sometime	46	11.8		
		Always	115	29.5		
		Total	390	100.0		
	Practices about care for immunization side effects					
16	Consult health care provider when side effects arise	Never	290	74.4	1.42	.761
		Sometime	35	9.0		
		Always	65	16.7		
		Total	390	100.0		
17	Gave the child an anti-inflammatory when he feels pain	Never	281	72.1	1.45	.766
		Sometime	43	11.0		
		Always	66	16.9		
		Total	390	100.0		
18	Gave anti-pyretic for high temperature on the day of vaccination	Never	159	40.8	1.98	.894
		Sometime	79	20.3		
		Always	152	39.0		
		Total	390	100.0		
19	Use cool compresses for swelling at the injection site	Never	206	52.8	1.77	.882
		Sometime	67	17.2		
		Always	117	30.0		
		Total	390	100.0		

N (390), cut-off point (0.66), Never (mean of score 1-1.66), Sometimes (mean of scores (1.67-2.33), and Always (mean of score 2.34-3).

Findings demonstrated evaluation of the study sample responses regarding practices about immunization of children; The results indicate that majority (73 %) of questionnaire items Never did practices, while (27%) was Sometimes applied practices.

Table 4.7 Mother's practices to the overall immunization of children.

Items	Rating	Frequency	Percent	Mean	SD.
Overall mothers Practices	Never	241	61.8	1.61	.660
	Sometime	71	18.2		
	Always	78	20.0		
	Total	390	100.0		

N (390), cut-off point (0.66), Never (mean of score 1-1.66), Sometimes (mean of scores (1.67-2.33), and Always (mean of score 2.34-3).

Findings illustrated that (61.8%) of mothers expressed never applied practices toward immunization of children, and (20%) of them Always do the practices while (18.2%) of mothers Sometime used that.

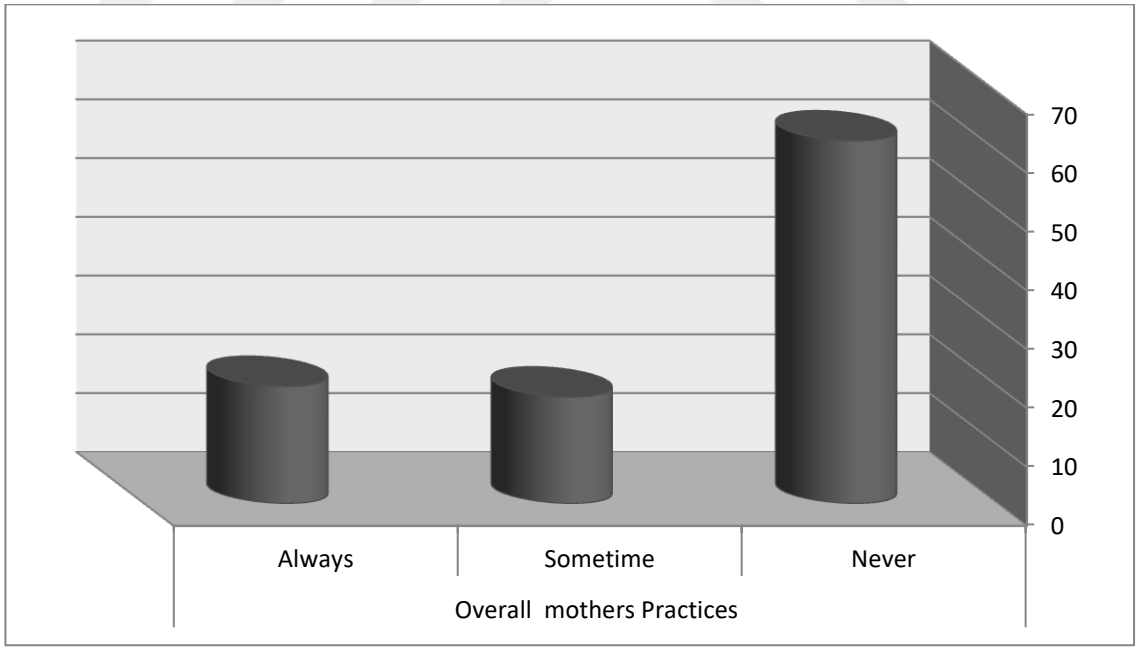

Figure 4.6 Distribution of study sample by their overall practices regarding immunization of children.

Table 4.8 Mean differences (ANOVA) between overall mother's knowledge about immunization of children and their demographic characteristics.

		Sum of Squares	df	Mean Square	F	Sig.
Age	Between Groups	75.813	100	.758	1.534	.003
	Within Groups	142.854	289	.494		S
	Total	218.667	389			
level education	Between Groups	1324.564	100	13.246	52.381	.000
	Within Groups	73.080	289	.253		S
	Total	1397.644	389			
Source of information about immunization	Between Groups	63.041	100	.630	.816	.883
	Within Groups	223.225	289	.772		NS
	Total	286.267	389			
child's age	Between Groups	77.340	100	.773	.997	.496
	Within Groups	224.157	289	.776		NS
	Total	301.497	389			NS
Immunization status up-to-age	Between Groups	103.550	100	1.035	17.274	.000
	Within Groups	17.325	289	.060		S
	Total	120.874	389			
Reasons for partial immunization	Between Groups	3209.786	100	32.098	7.930	.000
	Within Groups	1169.714	289	4.047		S
	Total	4379.500	389			

The findings showed significant variations in mothers' knowledge about their children's immunization concerning age, degree of education, immunization status up to age, and reasons for partial immunization ($p > 0.05$). Furthermore, there were no significant variations in the Mother's knowledge of the vaccination of children with the source of information regarding vaccination and the child's age.

Table 4.9 Mean differences (t-test) between the overall mother's knowledge about immunization of children and their occupation status.

Occupation		N	Mean	SD. Deviation	t	df	Sig.
Overall assessment	Employed	138	2.1981	.59339	13.255	388	.000 S
	Unemployed	252	1.4528	.49355			

(n) number, (SD.) stander deviation,(Ns): Non-significant (S): significant, (T value): independent t-test, (df): degree of freedom .

The findings showed the statistical significance, at a p-value of 0.05 or below, between mothers' employment position and their overall rating of mothers' knowledge regarding the vaccination of children.

Table 4.10 Mean differences (t-test) between the overall mother's knowledge about immunization of children assessment and their Residence.

Residence		N	Mean	SD. Deviation	t	df	Sig.
Overall assessment	Urban	242	2.0387	.58589	16.486	388	.000 S
	Rural	148	1.1955	.27342			

(n) number, (SD.) stander deviation,(Ns): Non-significant, (S): significant, (T value): independent t-test, (df): degree of freedom.

This table demonstrates a statistically significant correlation, with a p-value of 0.05 or less, between the mothers' location of residence and the overall assessment of their knowledge regarding their children's vaccinations.

Table 4.11 Mean differences (ANOVA) between overall mother's attitude toward immunization of children and their demographic characteristics.

		Sum of Squares	df	Mean Square	F	Sig.
Age	Between Groups	173.554	30	5.785	46.037	.000
	Within Groups	45.113	359	.126		S
	Total	218.667	389			
level education	Between Groups	350.334	30	11.678	4.003	.000
	Within Groups	1047.310	359	2.917		S
	Total	1397.644	389			
Source of information about immunization	Between Groups	23.369	30	.779	1.064	
	Within Groups	262.898	359	.732		.379
	Total	286.267	389			NS
child's age	Between Groups	40.991	30	1.366	1.883	.004
	Within Groups	260.506	359	.726		S
	Total	301.497	389			
Immunization status up-to-age	Between Groups	26.844	30	.895	3.416	.000
	Within Groups	94.031	359	.262		S
	Total	120.874	389			
Reasons for partial immunization	Between Groups	745.834	30	24.861	2.456	.000
	Within Groups	3633.666	359	10.122		S
	Total	4379.500	389			

The findings showed significant variations in mothers' attitudes about their children's immunization to age, degree of education, child's age, immunization status up-to-age, and reasons for partial immunization ($p > 0.05$). No significant differences were found in mothers' attitudes about the vaccination of their children about the source of information about vaccination.

Table 4.12 Mean differences (t-test) between the overall mother's attitude toward immunization of children and their occupation status.

Occupation		N	Mean	SD. Deviation	t	df	Sig.
Overall attitude	Employed	138	2.4891	.42223	.874	388	.383 NS
	Unemployed	252	2.4509	.40761			

(n) number, (SD.) stander deviation,(Ns): Non-significant, (S): significant, (T value): independent t-test, (df): degree of freedom.

This table shows that there is no statistical significance between mothers' occupational status and their overall attitude of mothers toward the immunization of children at a p-value equal to or less than 0.05.

Table 4.13 Mean differences (t-test) between the overall mother's attitude toward immunization of children and their Residence.

Residence		N	Mean	SD. Deviation	t	df	Sig.
Overall attitude	Urban	242	2.4851	.41481	1.257	388	.209 NS
	Rural	148	2.4311	.40846			

(n) number, (SD.) stander deviation,(Ns): Non-significant, (S): significant, (T value): independent t-test, (df): degree of freedom.

This table shows that there is no statistical significance between mothers' occupational status and their overall attitude of mothers toward the immunization of children at a p-value equal to or less than 0.05.

Table 4.14 Mean differences (ANOVA) between overall mothers' practices evaluation regarding immunization of children and their demographic characteristics.

		Sum of Squares	df	Mean Square	F	Sig.
Age	Between Groups	44.853	37	1.212	2.455	.000 S
	Within Groups	173.814	352	.494		
	Total	218.667	389			
level education	Between Groups	1270.605	37	34.341	95.152	.000 S
	Within Groups	127.038	352	.361		
	Total	1397.644	389			
Source of information about immunization	Between Groups	33.968	37	.918	1.281	.133 NS
	Within Groups	252.299	352	.717		
	Total	286.267	389			
child's age	Between Groups	46.164	37	1.248	1.720	.007 S
	Within Groups	255.334	352	.725		
	Total	301.497	389			
Immunization status up-to-age	Between Groups	90.385	37	2.443	28.202	.000 S
	Within Groups	30.490	352	.087		
	Total	120.874	389			
Reasons for partial immunization	Between Groups	2676.958	37	72.350	14.958	.000 S
	Within Groups	1702.542	352	4.837		
	Total	4379.500	389			

The findings showed significant differences in Mother's practices toward immunization of children about age, child's age, level of education, Immunization status up-to-age, and Reasons for partial immunization ($p > 0.05$). There were no significant variations in mothers' habits towards vaccinating their children about the source of information about vaccination

Table 4.15 Mean differences (t-test) between the overall mother's practices evaluation regarding immunization of children and their occupation status.

Occupation		N	Mean	Std. Deviation	t	df	Sig.
Overall evaluation	Employed	138	2.0667	.64299	11.513	388	.000 S
	Unemployed	252	1.3707	.52737			

(n) number, (SD.) stander deviation,(Ns): Non-significant, (S): significant, (T value): independent t-test, (df): degree of freedom.

This table shows statistical significance between mothers' Occupation status and the general practices of mothers toward immunization of children at a p-value equal to or less than 0.05.

Table 4.16 Mean differences (t-test) between the overall mother's practices evaluation regarding immunization of children and their residence.

Residence		N	Mean	Std. Deviation	t	df	Sig.
Overall evaluation	Urban	242	1.9354	.62497	15.318	388	.000 S
	Rural	148	1.1021	.28443			

(n) number, (SD.) stander deviation,(Ns): Non-significant, (S): significant, (T value): independent t-test, (DF): degree of freedom.

This table shows statistical significance between mothers' Residence and the general practices of mothers toward immunization of children at a p-value equal to or less than 0.05.

5. DISCUSSION OF THE STUDY RESULTS

5.1. Demographic characteristics of the mothers and children

The current study showed the results of maternal socio-demographic characteristics information in terms of frequencies and percentages. Among the mothers participating in this study (390), the age group more significant than or equal to 26 years constituted more than half of the study sample (50.3%). This study is consistent with a study conducted by (Ali et al., 2020), which showed that the largest age group in his sample was 25 to 34 years.

In education, the percentage of mothers who graduated from primary school reached (33.0%). This study agrees with a previous study conducted by (Mahalingam *et al*. 2014), where the highest percentages in a study regarding education were primary education level.

Concerning the employment situation, the study's results showed that most mothers are unemployed and constituting (64.6%), and this study was consistent with a study conducted by (Kadhim 2015),The results of his sample indicated that mothers are unemployed.

Mothers' residence was predominant in urban areas and accounted for more than half compared to rural areas, reflecting (62.1 percent) of the total number of samples. This study agrees with a previous study conducted by (Arceo *et al*. 2021), where the results of a sample of mothers who live in urban areas are precise.

It is also clear from the results that the majority of the study sample (55.6%) were obtaining information about vaccination from health institutions, and this study agrees with a previous study conducted by (Almutairi *et al*. 2021), where the results showed that the source of most mothers' information about immunization is health institutions.

Regarding the child's age, the results showed that the infant rate was more than half (53.8%), and these results are consistent with a previous study conducted by (Abbas *et al.* 2018), where the study found that the proportion of infants was more than half.

The study's results showed that in the case of children immunized, (61%) were partially immunized. This study agrees with a previous study conducted by (Angadi *et al*. 2013), which showed that more than half of his sample had partially vaccinated their children.

As for a reason for not vaccinating or partial vaccination, the child was not in good health. Moreover, it reflects (20.3 percent) of the total number of samples, as this study agrees with a previous study (Mahmmod *et al*. 2021),The results of its sample were that the reason for the absence of immunization or partial immunization is that the child was not in good health, as constituted more than half.

5.2. Discussion of overall assessment of mothers' knowledge of immunization

The findings indicated that the mothers' understanding of vaccination was limited since most of the mothers gave negative responses (58.7 percent), as shown in Tables (4-3).

These results differ from a study conducted by (Lamiya *et al*. 2019),Show that more than half of mothers have good knowledge of immunization.

Also, this result differs from his study (Mahmoud *et al*. 2021),Show that most mothers have a good knowledge of immunization and its importance in eliminating diseases and limiting their spread.

While the results of the current study agree with the survey conducted by (Kadhim 2015), the results showed that most mothers' knowledge of children's vaccination was weak.

Also, this result is consistent with his study (Ramadan *et al.* 2016), which showed that most of the studied mothers had a poor cognitive scores.

5.3. Discussion of overall assessment of mothers' attitudes towards immunization

The results showed that nearly half of the study sample (55.9%) of mothers had good attitudes toward vaccination, as shown in Tables (4-5).

This outcome is congruent with research (Arceo *et al*. 2021), that found half of the moms were pro-vaccination.

Also, This result is consistent with a study conducted by them (Ali *et al.* 2020), Which showed that the vast majority of mothers had positive opinions.

Also, This result is consistent with his study (Adedire *et al*. 2021), which showed that mothers' attitudes towards vaccination are good.

5.4. Discussion of overall assessment of mothers' practices towards immunization

The study's results showed that (61.8%) of the mothers participating in the study had poor practices regarding immunizing their children. As shown in Table (4-7).

This contradicts (Arceo *et al.* 2021), which showed that most mothers have good practices toward vaccination.

Moreover, these results differ from the study (Al-Mutairi *et al.* 2021), that showed the participation of mothers. There is good practice in the study regarding the vaccination of children.

While This finding agrees with (Hamid *et al*. 2012), where half of the mothers had poor practices towards vaccination.

This finding is also consistent with a study conducted by (Jessica *et al*. 2020), which showed that most of the study sample had poor immunization practices.

5.5. Association between overall mothers' knowledge and their sociodemographic characteristics

According to the findings of this study, there were significant disparities in the mother's awareness of children's vaccination concerning age, educational level, immunization status up to age, and reasons for incomplete immunization ($p > 0.05$).

The alternative research hypothesis was accepted. So, education level is a contributory factor that helps mothers understand the immunization schedule, use health information, and enable them to express whether they know, are uncertain, or do not know.

These results agree with a study conducted by (Adedir *et al*. 2021), which found a link between education and knowledge.

Also, This finding is similar to the findings of a study done by (Verulava *et al.* 2019), which found a connection between mothers' education and vaccination awareness. The study found that educated mothers were more likely to vaccinate their children entirely.

Contrary to their findings (Arceo *et al*. 2021), they found no connection between maternal knowledge and demographic factors.

As for the relationship between knowledge and professional status, Table (4-9) shows. Hat has a statistically significant relationship between mothers' work and their awareness regarding child vaccination (p 0.05).

These findings match a (Lamiya *et al*. 2019), where the results showed that mothers' occupational status is significantly associated with knowledge related to immunization.

Also, this result agrees to some extent with a study conducted by (Singh *et al*. 2018), which found a good correlation between vaccination coverage and mother profession.

As for the association between mothers' knowledge and their residence, Table (4-10) reveals a statistical significance between mothers' houses and their general evaluation of mothers' knowledge of children's vaccination with a p-value equal to or less than 0.05.

These results (Mahalingam *et al.* 2014), found a substantial difference between mothers' vaccination awareness and place of residency.

5.6. Association between overall mothers' attitudes and their sociodemographic characteristics

The findings indicated that there were statistically significant differences between the mothers' attitudes toward immunizing their children and the demographic characteristics of mothers in terms of age, education degree, child's age, vaccination status up to age, and reasons for partial immunization ($p > 0.05$).

These findings are similar to a previous study (Verulava *et al*. 2019), in which it was shown that there is a significant association between mother viewpoints and demographic parameters such as maternal education and child immunization.

Regarding the mother's occupation and trends, This study did not uncover a statistically significant association between the mother's occupation and her attitudes regarding her children's immunization.

These results differ from a study conducted by (Ahmed *et al*. 2013), which showed a statistically significant relationship between mothers' occupation and their attitudes towards the vaccination of their children.

While these results are in agreement with a study conducted by (Al-Mutairi *et al*. 2021) which found no statistically significant connection between mothers' vaccination views and socio-demographic factors.

As for mothers' place of residence and their attitudes, The current study found no statistically significant association between mothers' opinions and place of residence about child immunization.

This result differs from a study by (Mahalingam *et al*. 2014), which showed a statistically significant relationship between parental attitudes and residency.

These results are consistent with a study by (Arceo *et al*. 2021), that found no association between maternal attitudes and maternal demographic factors.

5.7. Association between overall mothers' practices and their sociodemographic characteristics

The results showed statistically significant differences in mothers' vaccination practices based on their age and education level (p. 0.05).

The findings of the current study contrast with those obtained by (Al-Mutairi *et al*. 2021), who found no statistically significant link between there was a statistically significant relationship between the habits of the participating mothers regarding vaccination and the socio-demographic factors (P > 0.05).

Contrary to their findings (Arceo *et al.* 2021), there was no significant connection between maternal practices and maternal demographic characteristics.

These findings align with those obtained in research by (Lamiya *et al*. 2019), which discovered a substantial correlation between maternal education and vaccination rates.

Regarding the mother's work and practices, this study found a statistically significant relationship between the mother's profession and her practices in immunizing her children.

These findings are consistent with the findings of a study carried out by (Ahmed *et al*. 2013), which demonstrated a relationship that can be considered statistically significant between the mothers' occupations and how they choose to vaccinate their children.

As for the practices of mothers and their place of residence, An association between mothers' vaccination habits and their residency location was identified in the current study, and it was statistically significant.

This finding is in line with the findings of the research (Mahalingam *et al*. 2014), that discovered a statistically significant difference between the maternal practices and the residency variable.

6. CONCLUSIONS AND RECOMMENDATIONS

This chapter presents conclusions from the study, discussing the results and their interpretation. The recommendations are based on the study's conclusion.

6.1. Conclusions

1. Of the 390 mothers who participated in the study, half of the study sample were aged 26 or older.

2. In terms of education, most mothers participating in the study had primary education.

3. According to the current survey, most moms get information about vaccinations from health workers.

4. More than half of the moms in the research (58.7%) had inadequate vaccination knowledge.

5. According to the study's findings, there are instances in which the scheduled appointments for vaccinating children in the city of Diwaniyah are not kept, and the excuse given is that the kid was not in good health on the scheduled appointment day.

6. The study discovered a statistically significant association between mothers' knowledge and behaviors and their career and domicile, but No correlation was found between moms' opinions and their location or occupation.

7. According to the findings of the study, the majority of the moms who were evaluated had terrible practices when it came to the immunization of their children.

8. According to the study's findings, moms' knowledge substantially impacted their children's vaccination status.

9. According to the study's findings, some mothers believed that mild illnesses such as vomiting, flu, jaundice, and other symptoms were a contraindication to child immunization.

6.2. Recommendations

From the present thesis, the following recommendations are put forward;

1. It is feasible to improve mothers' understanding of, attitudes toward, and behavior toward the national immunization program by adopting a good education program and health promotion interventions.

2. Inform women of the standard immunization schedule, emphasizing the importance of vaccination, when it should be administered, any potential side effects or contraindications, and illnesses that vaccination may prevent.

3. The mother's education level should be considered while establishing an education program, particularly when the mothers have a low level of education.

4. Partial preschool vaccination in Al-Diwanyah City, Iraq, clearly warrants particular attention. To increase childhood vaccination and parental motivation, accessibility, and follow-up, while describing the probable adverse effects and treatment strategies.

5. Increase the number of health care workers trained in vaccination clinics to increase immunization rates and identify missed opportunities, as evidenced by the fact that most mothers received information from health care experts.

6. Increased health education is necessary to combat negative attitudes around childhood immunization.

7. Some socio-demographic variables, l have a significant influence on immunization status. As a result, efforts should be directed toward improving and educating the public about vaccines to raise awareness.

8. Immunizations should be made available to every mother and child, and they should be offered in all primary health care over the whole days of the week.

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APPENDICES

APPENDIX 1. Questionnaire

Veri Toplama Formu

Irak'ın AL-Diwaniyah şehrinde Annelerin Ulusal Aşılama Programına İlişkin Bilgi, Tutum ve Uygulamalarının Değerlendirilmesi

Sizi Wael Salim Lahmood Al-Naieli ve Dr.öğr.üyesi Yaşar Kemal Yazgan tarafından yürütülen "Irak'ın AL-Diwaniyah şehrinde Annelerin Ulusal Aşılama Programına İlişkin Bilgi, Tutum ve Uygulamalarının Değerlendirilmesi" başlıklı araştırmaya davet ediyoruz. Bu araştırmaya katılma kararı vermeden önce araştırmanın neden ve nasıl yapılacağını bilmeniz gerekmektedir. Bu nedenle bu formun okunup anlaşılması çok büyük önem taşımaktadır. Eğer anlamadıysanız, sizin açık olmayan bilgiler varsa ya da daha fazla bilgi isterseniz bize sorunuz. Bu çalışmaya katılmak tamamen gönüllülük esasına dayanmaktadır. Çalışmaya katılmamaya veya katıldıktan sonra çalışmadan çıkma hakkına sahipsiniz. Çalışmaya yanıtlamanız araştırmaya katılım için onam verdiğiniz biçiminde yorumlanacaktır. Size verilen formlardaki soruları yanıtlarken kimsenin baskısı veya telkini altında olmayınız. Bu formlardan elde edilecek kişisel bilgiler tamamen gizli tutulacak ve yalnızca araştırma amacı ile kullanılacaktır

Birinci bölüm: Sosyo-demografik özellikler özellikleri

Birincisi: annenin demografik özellikleri

1. Yaşı ☐

2. Eğitim düzeyi

A- Sadece okuyabiliyor ☐

B- Okuma yazma biliyor ☐

C- Ilkokul mezunu ☐

D- Ortaokul mezunu ☐

E- Lise mezunu ☐

F- Lisans Mezunu ☐

G- Lisansüstü ☐

3- Mesleği:

A- Çalışmıyor ☐ **B-** Çalışıyor ☐

4- İkametgahı:

A- ☐ Kırsal **B-** ☐ Kent

5- Aşılama hakkında bilgi kaynağı:

A- ☐ Televizyon
B- ☐ Sosyal iletişim
C- ☐ Sağlık çalışanları
D- ☐ Ebeveynler, akrabalar ve komşular

İkincisi: çocuğun demografik özellikleri

1. Yaşı

A- Yenidoğan ☐
B- Yürümeye başlayan çocuk ☐
C- Bebek ☐
D- Okul öncesi ☐

2- Bu yaşına kadar olan aşılama durumu:

A- Tam aşılıd ☐
B- Kısmi aşılı ☐
D- Aşısız ☐

3- Kısmi aşılama nedenleri

A- HSM'ye merkezine uzaklık ☐
B- Aşının bulunamaması ☐

C- Yan etki korkusu ☐

D- Bilgi eksikliği ☐

E- Tekrarlanan dozun alınmasının unutulması ☐

F- Annenin hasta olması ☐

G- Çocuğun hasta olması ☐

H- Aşıdan memnuniyetsizlik ☐

I- Diğerleri ☐

İkinci bölüm: Annenin bağışıklama Yönelik Bilgisi

1	**Aşılama kavramı hakkında bilgiler**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	Aşılama, hastalıklara karşı antikor üretmesi için bağışıklık sistemini uyarma işlemidir.			
2	Çocuklara aşı önerilir			
3	Çocuğun bir veya daha fazla aşısını kaçırılmışsaz, kaçırılan doz bir sonraki ziyaretinizde yapılır.			
4	Çocuğun bir önceki aşı dozundan sonra ciddi bir alerjik reaksiyonu varsa, çocuk aşı programından çıkarılmalıdır.			
5	Karma aşılar, esas olarak aşının etkisini artırmak için kullanılır.			
6	Gecikmiş büyüme ve gelişme aşı ile ilgili önemli bir faktör değildir.			
7	Hastalık, çocuğun aşıyı tolere etmesini engellemez			
2	**Bağışıklamanın önemi hakkında bilgiler**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	Çocuğu bulaşıcı hastalıklardan korur			
2	Çocuk sağlığını korur			
3	Çocuk ölümlerini ve sakatlıklarını azaltır			

4	Çocukları hastalık komplikasyonlarından korur			
5	Çocukların kendilerine karşı aşıladıkları hastalıklar, çocuğun sinüslerini yaşamın ilk yılında korur.			
6	Hayatı tehdit eden hastalıkları önler			
7	Aşılama, on yaşına kadar çocuğun yaşamı için koruma sağlar			
3	**Aşı reaksiyonları hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	Minör reaksiyonlar genellikle aşının verilmesinden sonraki birkaç saat içinde meydana gelir.			
2	Küçük tepkiler çocuğun hayatı için tehdit oluşturmaz			
3	Lokal minör reaksiyonlar, enjeksiyon bölgesinde ağrı, şişme veya kızarıklık içerir.			
4	Aşıların genel yan etkileri ateş, halsizlik, iştahsızlıktır.			
5	Şiddetli reaksiyonlar genellikle uzun süreli sorunlara yol açmaz.			
6	Şiddetli reaksiyonlar, vücudun bir aşıdaki belirli bir bileşene verdiği tepkinin neden olduğu nöbetleri ve alerjileri içermektedir.			
4	**Rutin aşılama hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
12	Bebek doğumdan sonra aşı programına başlamalı			
3	Devlet tarafından ücretsiz aşı yapılıyor			
4	Çocuklara, bağışıklıklarını oluşturmak için belirli belirli sürelerle ayrılmış sık dozlarda aşı verildi.			
5	aynı anda birden fazla aşı yapmak mümkündür			
6	zaman çocuğun bağışıklığını arttırır ve olumsuz etkilemez			
5	**Aşılama kontrendikasyonları hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
A	**Çocuğa aşağıdaki durumlarda aşı yapılabilir:**			
1	yetersiz beslenme			
2	İshal			
3	mevsimsel grip			

4	Kusma			
5	Alerji			
6	Nezle, soğuk algınlığı			
7	Orta kulak iltihabı			
8	Sarılık			
B	**Aşağıdaki durumlarda çocuğa aşı yapılamaz:**			
1	immünolojik hastalık			
2	Bağışıklamadan sonra önceki şiddetli alerjik reaksiyon			
3	HIV enfeksiyonu			
4	nörolojik bozukluklar			
5	şiddetli ateş			
6	**BCG aşısı hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	Tüberkülozu önler			
2	Çocuğun hayatının ilk haftasında verilir.			
3	BCG aşısı, bir hafta veya birkaç hafta içinde enjeksiyon bölgesinde yara izi oluşturur			
4	BCG aşısı, daha önceki bir doz alınmamış olsa bile, yaşamın ilk yılının tamamlanmasından sonra çocuğa yapılmaz.			
7	**Oral çocuk felci aşısı hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	Çocuk felcini önler			
2	Çocuğun hayatının ilk haftasında sıfır doz çocuk felci aşısı yapılır.			
3	Oral aşıdan sonra bebek (20-30 dakika) emzirilmez.			
4	Aşı takvimine göre 6 yaşındaki çocuk en az 6 doz OPV alacaktır.			

8	Hepatit B aşısı hakkında bilgi	Biliyorum	Emin değilim	Bilmiyorum
1	Hepatit B aşı ile önlenebilir			
2	Hepatit B'nin ilk dozu (çocuğun yaşından itibaren) 24 saat içinde verilir.			
3	6 yaşından önce 6 doz Hepatit B Aşısı gereklidir.			
9	**(difteri, tetanoz, boğmaca) aşısı hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	Difteri, tetanoz, boğmacayı önleyen aşıdır.			
2	DTP aşısı 2, 4, 6 ve 18 aylıkken ve 4-6 yaşlarında yapılır.			
10	**Kızamık hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	Kızamığı önleyen bir aşıdır.			
2	Kızamık aşısı 9 aylıkken yapılır			
11	**Kızamık, kabakulak, kızamıkçık hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	Kızamık, kabakulak, kızamıkçık önleyici bir aşıdır.			
2	MMR 15 aylıkken ve 4-6 yaşlarında verilir.			
12	**Haemophilus influenzae tip b aşısı hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	Menenjit ve pnömoni Hib aşısı ile önlenebilir			
2	Altı yaşından küçük çocuklar için dört doz Hib aşısı gereklidir			
13	**Rotavirüs aşısı hakkında bilgi**	**Biliyorum**	**Emin değilim**	**Bilmiyorum**
1	İshali önlemek için rotavirüs aşısı mevcuttur			
2	6 yaşından önce 3 doz Rotavirüs aşısı gereklidir.			
3	Çocuğa üç aylıktan büyükse ve aşı başlatılmamışsa rotavirüs virüsü verilmez.			
4	Çocuğa sekiz aylıktan sonra reçete edilen dozu tamamlamasa bile rotavirüs aşısı yapılmaz.			

Üçüncü Bölüm: Annenin Aşıya Yönelik Tutumları

1	Aşının önemine ilişkin tutumlar	Katılıyorum	Emin değilim	Katılmıyorum
1	Çocukların aşılanması için aşıların güvenli olduğunu düşünüyorum			
2	Bence aşıların faydaları zararlarından fazla			
3	Çocuğun sağlığını koruduğu için tercihli aşım var			
4	Her çocuk için en iyisiydiler			
5	Toplumu kurtardığı için aşılamayı tercih ederim			
6	Ölüm oranını azalttığı için aşılamayı tercih ederim			
7	Bulaşıcı hastalıkların önlenmesinde etkili olduğu için bağışıklamayı tercih ederim.			
8	Tetanoz aşısının bebek ve anne sağlığı için önemli olmadığını düşünüyorum			
9	Bence erkekler için aşı kızlardan daha önemli			
2	**Rutin aşılama ile ilgili tutumlar**	**Katılıyorum**	**Emin değilim**	**Katılmıyorum**
1	Aşılamayı programa göre yaptırmayı tercih ederim			
2	Geleneksel bir şifacı tarafından tedavi edilen veya tedavi gören bir çocuk yine de aşı olmalıdır.			
3	Çocuk aşıyı almadan önce sağlık çalışanlarının aşıdan haberdar olması en iyisidir.			
4	Çocuğuma hasta olmadığı için aşı yaptırmayacağım.			
5	Çocuğumu aşıya götürmek için kocamın iznine ihtiyacım var			
6	İşime gitmek benim için bir çocuğu aşı için sağlık kuruluşuna götürmekten daha önemli			

3	Aşılama yan etkilerine ilişkin tutumlar	Katılıyorum	Emin değilim	Katılmıyorum
1	Bence aşı zararlı değil			
2	Aşının çocuklara bulaşıcı hastalıklara karşı bağışıklık kazandırdığını düşünüyorum.			
3	Bence çocuk aşıdan sonra enfekte olmuyor			
4	Aşılamanın ciddi yan etkileri olduğunu tahmin ediyorum			
5	Sanırım yan etkiler ölüme neden oluyor			
6	Bence aşı çocukları hasta ediyor			
7	Bence aşı yapıldıktan sonra çocuk kendisine aşılanmış olan hastalığa yakalanacak.			

Dördüncü Bölüm: Annenin Aşıya Yönelik Uygulamaları

1	Rutin aşılama ile ilgili uygulamalar	Her zaman	Bazen	Asla
1	Çocuğun bir sonraki aşı tarihinin ne zaman olduğunu biliyorum			
2	aşı belgesini saklıyorum			
3	Çocuğun doğumdan sonraki 24 saat içinde hepatit B aşısı olduğunu düşünüyorum.			
4	Başkalarına çocuklarına aşı yaptırmalarını tavsiye ederim			
5	Çocuğun aldığı her aşıyı sağlık uzmanına sorarım.			
6	Çocuğum aşı takvimine göre aşı oluyor			
7	Çocuğumun aşı takvimine göre aşılarını bitirdim			
8	Hamilelik sırasında yapılan tetanoz toksoid aşısına katılıyorum			

2	**BCG yarası ile ilgili uygulamalar**	**Her zaman**	**Bazen**	**Asla**
1	BCG aşısı, sol kolun enjeksiyon bölgesindeki bir yara izine bakılarak onaylanır.			
2	Aşı yapıldıktan 90 gün sonra enjeksiyon bölgesinde iz kalmaması en iyi karar tekrardır.			
3	**Aşılama yan etkilerinin izlenmesine yönelik uygulamalar**	**Her zaman**	**Bazen**	**Asla**
1	Yüksek ateş			
2	Döküntü			
3	Enjeksiyon yerinde kızarıklık			
4	Enjeksiyon yerinde şişlik			
5	Enjeksiyon yerinde ağrı			
4	**Aşılama yan etkilerine yönelik bakım uygulamaları**	**Her zaman**	**Bazen**	**Asla**
1	Yan etkiler ortaya çıktığında sağlık uzmanına danışırım			
2	Çocuğa ağrı hissettiğinde bir anti-inflamatuar veririm			
3	Aşılama gününde yüksek ateş için ateş düşürücü veririm			
4	Enjeksiyon bölgesinde şişlik için soğuk kompresler kullanırım			

APPENDIX 2. Approval of the Iraq ethics committee

Sağlık Bakanlığı
AL-Diwaniyah Sağlık Müdürlüğü
Eğitim ve İnsan Geliştirme Departmanı
Bilgi Yönetimi ve Araştırma Bölümü
Araştırma Komitesi Kararı

Form No: 02/2021
Karar No: 29
Kayıt Tarihi: 09/12/2021

Araştırma Komitesi Kararı

Saygılarımızı sunarız...

AL-Diwaniyah Sağlık Departmanı Araştırma Kurulu, Türkiye Çankırı Üniversitesi / Sağlık Bilimleri Enstitüsü'ndeki araştırmacı **(WAEL SALIM LAHMOOD)** ve Merkez tarafından Araştırmaya sunulan

(Assessment of Mothers' Knowledge, Attitudes and Practices regarding National Immunization Programme in AL-Diwaniyah city in Iraq)

(Irak'ın AL-Diwaniyah şehrinde Annelerin Ulusal Aşılama Programına İlişkin Bilgi, Tutum ve Uygulamalarının Değerlendirilmesi)

başlıklı araştırma projesini inceledi. AL-Diwaniyah Sağlık Departmanında Eğitim ve İnsani Gelişme için Bilgi Yönetimi ve Araştırma Birimi 09/12/2021 tarihinde aşağıdaki kararları almıştır:

Yukarıdaki yazılı araştırma projesinin, araştırmanın uygulanmasına ilişkin Sağlık Bakanlığı tarafından onaylanan kriterlere uygun olması nedeniyle kabul edilmesinde ve kurumların daire başkanlığında uygulanmasında bir sakınca yoktur.

Ekler / Değişiklir ve Araştırma Kurulu Notları / Yoktur
Araştırma bilimsel koşulları karşılmaktadır ve bilimsel araştırma etiğine uygundur.
AL-Diwaniyah Birinci ve İkinci Bölgelerina bağı sağlık merkezlerinde araştırmaların kolaylaştırılmasına ve yürütülmesine bir itirazımız yoktur.

Araştırma Kurulu Başkanı
Uzman Doktor

APPENDIX 3. Approval the ethics committee from the ınstitute of health sciences, university of Cankiri .

T.C.
ÇANKIRI KARATEKİN ÜNİVERSİTESİ
ETİK KURUL DEĞERLENDİRME FORMU

Toplantı No:	25
Araştırmanın Yürütücüsü:	WAEL SALIM LAHMOOD ALNAIELI
Araştırmanın Başlığı:	İrak'ın AL-Diwaniyah şehrinde Annelerin Ulusal Aşılama Programına İlişkin Bilgi, Tutum ve Uygulamalarının Değerlendirilmesi
Karar Tarihi:	07-03-2022
Kurul Görüşü:	Kabul Edilmiştir. Araştırmanın/Projenin uygulanabilirliği konusunda bilimsel araştırmalar etiği açısından bir sakınca yoktur.

SONUÇ: Kabul Edilmiştir. Araştırmanın/Projenin uygulanabilirliği konusunda bilimsel araştırmalar etiği açısından bir sakınca yoktur.

Başkan
Prof. Dr. Hüseyin ODABAŞ
İMZA

Başkan Yardımcısı
Doç. Dr. Ela Özkan CANBOLAT
İMZA

Üye
Prof. Dr. Gülcihan YILDIRIM
İMZA

Üye
Doç. Dr. Hakan ÇOLAK
İMZA

Üye
Doç. Dr. Bilgehan TEKİN
İMZA

Üye
Doç. Dr. Emine ÇELİKSOY
İMZA

Üye
Dr. Öğr. Üyesi Serap Aslan COBUTOĞLU
İMZA

Üye
Dr. Öğr. Üyesi Haydar KOÇ
İMZA

Üye

APPENDIX 4. Committee of experts who evaluated the study tool.

List	Expert's name	The scientific title	Workplace	exact specialization	years of experience
1	Dr. Ameen Ajil Yasser	Professor	University of Babylon \ College of Nursing	PhD Nursing Community Health	37 Years
2	Dr. .Mohamed Fadel Khalifa	Professor	University of Baghdad \ College of Nursing	PhD Nursing Community Health	26 Years
3	Dr.Fatima Abdel Kadhim Reda	Assistant Professor	Al-Qadisiyah University \ College of Medicine	PhD of Community Medicine	10 Years
4	Dr. Alaa Muhaibes Tohma	Assistant Professor	Dhi Qar University \ College of Nursing	PhD Nursing Community Health	17 Years
5	Dr. Mansoor Abdullah Falah	Assistant Professor	University of Kufa / College of Nursing	PhD Nursing Community Health	15 Years
6	Dr. Naseer Mowaffaq Younes	Assistant Professor	Mosul University \ College of Nursing	PhD of Philosophy of Nursing	١٨ Years
7	Dr. Mortada Ghanem Aday	Assistant Professor	University of Kufa / College of Nursing	PhD Nursing Community Health	15 Years
8	Dr. Suha Attia Kadhum	Assistant Professor	University of Baghdad \ College of Health and Medical Technologies	Master's in Community Health	٢٠ Years
9	Dr. Ashraq Ahmed Jiyad	Assistant Professor	University of Baghdad \ College of Health and Medical Technologies	Master's in Community Health	23 Years
10	Dr. Aysen Kamal Mohamed Nouri	Lecture	Al-Qadisiyah University \ College of Medicine	PhD Nursing Community Health	17 Years
11	Dr. Alaa Ibrahim Saeed	Lecture	Al-Qadisiyah University \ College of Nursing	PhD of Adult Nursing	26 Years
12	Dr. Haider Ameer Jabur	Lecture	Al-Qadisiyah University \ College of Nursing	PhD in mental health	15 Years

CIRRICULUM VITAE

Name and surname : Wael AL-NAIELI

Education status

Undergraduate : 2015, University of Al-Qadisiya , College of nursing

Career :Employee at Al-Diwaniyah Teaching Hospital

Work start date : 03-29-2017-Still -nurse in Department of Oncology

Certificates :1- TOT in administering chemotherapy/2017

2- Certificate of attencance for attending the iraqi integrated oncology healthcare program /2018

3- Certificate of completion/Childern cancer hospital Egypt /2018