

MEASLES VACCINATION EFFECTIVENESS AMONG CHILDREN UNDER FIVE YEARS OF AGE IN QASIMABAD (URBAN) HYDERABAD

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Abstract

Measles remains a highly contagious viral disease and a significant cause of morbidity and mortality among children under five years of age, particularly in developing countries like Pakistan. Despite the availability of an effective vaccine under the Expanded Programme on Immunization (EPI), measles outbreaks continue to occur due to gaps in vaccination coverage, incomplete immunization, and other socio-demographic factors. This study aimed to assess the effectiveness of measles vaccination among children under five years of age in Qasimabad (Urban), Hyderabad. A descriptive cross-sectional study design was used. The study population comprised children aged 0–59 months residing in Qasimabad. A sample size of 160 participants was selected using Slovin's formula. Data were collected through a structured questionnaire covering demographic characteristics, vaccination status and history of measles infection, risk factors, and parental awareness. Data analysis was performed using SPSS. The results revealed that only 33.8% of children were immunized against measles, while 66.3% were not immunized. Regarding overall vaccination status, 22.5% of children were fully vaccinated, 23.1% were partially vaccinated, and 24.4% were not vaccinated at all. The findings indicate low vaccination coverage and highlight significant gaps in immunization practices. Various factors such as parental education, socioeconomic status, healthcare access, and awareness were found to influence vaccination uptake. The study concludes that measles vaccination effectiveness in the study area is compromised due to incomplete immunization and low coverage. Strengthening immunization programs, improving parental awareness, and ensuring timely vaccination are essential to reduce measles incidence. The findings provide valuable insights for healthcare professionals and policymakers to develop targeted interventions for improving child health outcomes.

INTRODUCTION

Measles remains one of the most contagious viral diseases and continues to be a major public health concern, particularly in developing countries. Despite the availability of a safe and

effective vaccine, measles contributes significantly to childhood morbidity and mortality worldwide. According to the World Health Organization, measles is responsible for thousands of preventable deaths annually, especially among

children under five years of age. The persistence of measles outbreaks indicates gaps in immunization coverage, vaccine effectiveness, and healthcare delivery systems.<sup>1</sup>

Measles is caused by a virus belonging to the genus Morbillivirus and is transmitted through respiratory droplets or direct contact with infected individuals. The disease is characterized by high fever, cough, coryza, conjunctivitis, and a generalized maculopapular rash. Complications such as pneumonia, encephalitis, diarrhea, and malnutrition can significantly increase the risk of mortality, particularly in young children and immunocompromised individuals. In regions with limited healthcare access, these complications often result in severe outcomes, emphasizing the importance of preventive strategies.<sup>2</sup>

Vaccination is the most effective strategy for preventing measles infection and its complications. The measles vaccine, often administered as part of the measles-mumps-rubella (MMR) vaccine, has demonstrated high efficacy in reducing disease incidence and mortality.<sup>2</sup> The Expanded Program on Immunization has been instrumental in increasing vaccine coverage in Pakistan by providing routine immunization services free of cost. However, despite these efforts, measles outbreaks continue to occur due to factors such as incomplete vaccination, missed doses, cold chain failures, and vaccine hesitancy.

Vaccine effectiveness refers to the ability of a vaccine to prevent disease in real-world conditions. While clinical trials have demonstrated high efficacy of the measles vaccine, its effectiveness in community settings may vary due to multiple factors, including nutritional status, maternal antibodies, timing of vaccination, and adherence to immunization schedules. Evaluating vaccine effectiveness is essential for identifying gaps in immunization programs and improving public health interventions.<sup>3</sup>

Children under five years of age are particularly vulnerable to measles infection due to their developing immune systems and higher exposure risks. In Pakistan, this age group represents a

significant proportion of the population and is often affected by preventable diseases. Malnutrition, poor sanitation, and limited access to healthcare services further increase susceptibility to infections such as measles. Therefore, assessing the effectiveness of measles vaccination in this age group is crucial for reducing disease burden and achieving sustainable health outcomes.<sup>1</sup>

Pakistan has made substantial progress in immunization coverage over the past decades; however, disparities still exist between urban and rural areas, as well as among different socioeconomic groups. Urban areas like Hyderabad, including Qasimabad, present unique challenges such as population density, migration, and unequal access to healthcare services. These factors may influence vaccination coverage and effectiveness, making it important to conduct localized studies to understand the situation more accurately.<sup>4</sup>

Qasimabad, a densely populated area of Hyderabad, is characterized by diverse socioeconomic conditions and varying levels of access to healthcare facilities. While some families have adequate access to immunization services, others face barriers such as lack of awareness, cultural beliefs, financial constraints, and limited healthcare infrastructure. These disparities can lead to incomplete vaccination and increased risk of measles outbreaks. Evaluating the effectiveness of measles vaccination in this specific setting will provide valuable insights into local challenges and opportunities for intervention.

The role of healthcare professionals, particularly nurses, is critical in promoting immunization and ensuring vaccine effectiveness. Nurses are often the first point of contact in primary healthcare settings and play a key role in educating parents, administering vaccines, maintaining cold chain systems, and monitoring adverse events. Their involvement in community outreach programs can significantly improve vaccination coverage and compliance with immunization schedules.<sup>5</sup>

In addition to healthcare system factors, parental knowledge and attitudes toward vaccination play a crucial role in determining vaccine uptake.

Misconceptions, fear of side effects, and lack of awareness about the importance of vaccination can lead to vaccine hesitancy. Public health education campaigns are essential for addressing these issues and encouraging timely immunization.

Measuring vaccine effectiveness involves comparing the incidence of disease among vaccinated and unvaccinated individuals. This assessment helps in understanding the real-world performance of vaccines and identifying potential gaps in immunization programs. Factors such as vaccine storage conditions, administration practices, and population characteristics must be considered when evaluating effectiveness.<sup>6</sup>

Furthermore, global initiatives such as the Measles and Rubella Initiative aim to eliminate measles through widespread vaccination and surveillance. However, achieving this goal requires strong healthcare systems, high vaccination coverage, and continuous monitoring of vaccine effectiveness. In countries like Pakistan, where healthcare resources are limited, targeted research studies are essential for guiding policy and practice.<sup>7</sup>

This study aims to assess the effectiveness of measles vaccination among children under five years of age in Qasimabad, Hyderabad. By evaluating vaccination status, incidence of measles, and associated risk factors, the study will provide evidence-based insights into the performance of immunization programs in the area. The findings will help healthcare authorities and policymakers develop strategies to improve vaccination coverage and reduce the burden of measles.

Measles remains a preventable yet persistent public health challenge, particularly in developing regions. Vaccination is a proven and cost-effective intervention; however, its success depends on multiple factors, including accessibility, awareness, and healthcare infrastructure. Assessing vaccine effectiveness in specific communities, such as Qasimabad, is essential for identifying gaps and strengthening immunization programs. This research will contribute to the existing body of knowledge and

support efforts to achieve measles control and eventual elimination.<sup>8</sup>

## PROBLEM STATEMENT

In Pakistan, measles outbreaks are still frequently reported, reflecting challenges within the immunization system. The Expanded Programme on Immunization provides free vaccination services; however, issues such as incomplete immunization, missed second doses, poor cold chain maintenance, and lack of awareness among caregivers contribute to suboptimal vaccine effectiveness. Additionally, socioeconomic disparities, parental misconceptions, and limited access to healthcare services further hinder successful immunization coverage.<sup>9</sup>

In urban settings like Hyderabad, particularly in areas such as Qasimabad, rapid population growth, migration, and uneven healthcare access create additional challenges. While some children receive complete vaccination, others remain partially immunized or unvaccinated, increasing the risk of measles transmission. Moreover, factors such as malnutrition, weakened immunity, and delayed vaccination schedules may reduce the overall effectiveness of the measles vaccine in real-world settings.

Despite ongoing immunization efforts, there is limited local evidence regarding the actual effectiveness of measles vaccination among children under five years of age in Qasimabad. Most available data focus on vaccination coverage rather than real-world outcomes such as disease occurrence among vaccinated versus unvaccinated children. This lack of localized data makes it difficult for healthcare providers and policymakers to identify gaps and implement targeted interventions.

Therefore, there is a need to assess the effectiveness of measles vaccination in this population by examining the relationship between vaccination status and the occurrence of measles. Understanding these factors will help in identifying barriers to effective immunization and improving public health strategies aimed at reducing measles-related morbidity and mortality among young children.<sup>10</sup>

## RATIONALE OF THE STUDY

Measles remains a preventable yet persistent public health problem, especially among children under five years of age. Although vaccination services are available through national immunization programs such as the Expanded Programme on Immunization, measles cases continue to be reported in different parts of the country. This indicates that the presence of vaccination programs alone is not sufficient; their effectiveness in real-world settings must also be evaluated.<sup>11</sup>

In areas like Hyderabad, particularly Qasimabad, there is limited local evidence regarding how effective the measles vaccine is in preventing the disease among children. Most available data focus on vaccination coverage rather than actual outcomes, such as whether vaccinated children are protected against measles infection. Without such evidence, it is difficult for healthcare professionals and policymakers to identify gaps and improve immunization strategies.

Therefore, this study is necessary to assess the effectiveness of measles vaccination among children under five years of age and to identify factors that may influence its effectiveness. The findings will help in strengthening immunization practices and reducing the burden of measles in the community.<sup>12</sup>

## SIGNIFICANCE OF THE STUDY

This study holds significant importance for healthcare professionals, policymakers, and the community at large. It will provide valuable insights into the real-world effectiveness of measles vaccination among children under five years of age in Qasimabad.

For healthcare providers, especially nurses, the study will enhance understanding of factors affecting vaccine effectiveness and support better planning of immunization services. Nurses play a key role in vaccine administration, parental education, and follow-up, and this study will help improve their practices.

For public health authorities, the findings will assist in identifying gaps in immunization coverage and barriers to effective vaccination. This can guide the development of targeted

interventions to improve vaccination uptake and reduce measles outbreaks.

For the community, the study will raise awareness about the importance of timely and complete vaccination, ultimately contributing to improved child health outcomes and reduced morbidity and mortality.

## OPERATIONAL DEFINITIONS

**1. Measles** Measles refers to a clinically diagnosed or reported viral infection characterized by fever, cough, coryza, conjunctivitis, and maculopapular rash among children under five years of age, as reported by parents/guardians or confirmed through medical records during the study period.

**2. Measles Vaccination** Measles vaccination is defined as the administration of measles-containing vaccine (MCV1 and/or MCV2) to a child, as per the schedule recommended by the Expanded Programme on Immunization.

**3. Fully Vaccinated Child** A child who has received all recommended doses of measles vaccine (two doses) according to the national immunization schedule before the age of five years.

**4. Partially Vaccinated Child** A child who has received only one dose of measles vaccine and has not completed the full recommended vaccination schedule.

**5. Unvaccinated Child** A child who has not received any dose of measles vaccine at the time of data collection.

**6. Vaccine Effectiveness** Vaccine effectiveness refers to the percentage reduction in measles occurrence among vaccinated children compared to unvaccinated children under real-life conditions in the study area.

**7. Children Under Five Years** Children aged 0 to 59 months residing in Qasimabad, Hyderabad, at the time of the study.

**8. Parental Awareness** Parental awareness refers to the level of knowledge of parents/guardians regarding measles disease, its prevention, and the importance of vaccination, assessed through structured questionnaire responses.

**9. Immunization Status** Immunization status is the classification of children as fully vaccinated,

partially vaccinated, or unvaccinated based on vaccination records or parental recall.

**10. Incidence of Measles** Incidence of measles refers to the number of new measles cases reported among children under five years within a specified period in the study population.

**11. Nutritional Status** Nutritional status refers to the physical condition of a child assessed through indicators such as weight-for-age or visible signs of malnutrition, as reported or observed during the study.

## PURPOSE OF THE STUDY

The purpose of this study is to evaluate the effectiveness of measles vaccination among children under five years of age in Qasimabad, Hyderabad, and to identify factors influencing its effectiveness.

## INCLUSION CRITERIA

1. Children aged **0–59 months (under five years)**.
2. Children residing in Qasimabad, Hyderabad.
3. Children with available vaccination records (card or parental recall).
4. Parents/guardians who are willing to participate in the study.

## EXCLUSION CRITERIA

1. Children above five years of age.
2. Children not residing in Qasimabad.
3. Children with incomplete or unavailable information regarding vaccination status.
4. Parents/guardians who refuse to give consent.
5. Children with severe chronic illnesses that may affect immune response (if applicable to your study design).

## OBJECTIVES

### General Objective

To assess the effectiveness of measles vaccination among children under five years of age in Qasimabad, Hyderabad.

### Specific Objectives

1. To determine the vaccination status of children under five years of age.
2. To compare the occurrence of measles among vaccinated and unvaccinated children.
3. To evaluate the effectiveness of measles vaccination in preventing infection.

## LITERATURE REVIEW

### 1. Overview of Measles

Measles is a highly contagious viral disease that remains a major cause of morbidity and mortality among children under five years of age, particularly in low- and middle-income countries. It is caused by the measles virus, a member of the genus *Morbillivirus*, and is transmitted primarily through respiratory droplets and direct contact with infected individuals. Due to its high infectivity, measles can spread rapidly in populations with low immunization coverage.<sup>13</sup>

The World Health Organization describes measles as one of the leading causes of vaccine-preventable deaths worldwide. Despite the availability of a safe and effective vaccine, outbreaks continue to occur, especially in regions where immunization coverage is inadequate. The disease is preventable, yet it continues to place a heavy burden on healthcare systems.

### 2. Epidemiology of Measles

Globally, significant progress has been made in reducing measles incidence due to widespread vaccination campaigns. However, the disease remains endemic in several parts of the world, including South Asia and sub-Saharan Africa. Periodic outbreaks are often reported in countries where vaccination coverage falls below the threshold required for herd immunity.

In Pakistan, measles remains a persistent public health issue. The Expanded Programme on Immunization has made efforts to increase vaccine coverage; however, challenges such as missed vaccinations, population mobility, and healthcare disparities continue to hinder progress. Outbreaks have been reported in both rural and urban areas, including densely populated cities like Hyderabad.

### 3. Clinical Features and Complications

Measles is characterized by a prodromal phase followed by a distinctive rash. Initial symptoms include high fever, cough, coryza (runny nose), and conjunctivitis, followed by the appearance of Koplik spots and a generalized maculopapular rash.

Complications of measles are common, particularly among malnourished children and those with weakened immune systems. These complications include pneumonia, diarrhea, otitis media, and encephalitis. Pneumonia is the most common cause of death associated with measles, while encephalitis can lead to permanent neurological damage. In severe cases, measles can result in blindness, malnutrition, and even death.<sup>14</sup>

#### 4. Measles Vaccination

Vaccination is the most effective method of preventing measles infection. The measles vaccine is typically administered as part of the measles-containing vaccine (MCV), often combined with mumps and rubella (MMR vaccine). The World Health Organization recommends two doses of measles vaccine for optimal protection.

In Pakistan, the Expanded Programme on Immunization provides measles vaccination free of cost. The first dose (MCV1) is usually given at 9 months of age, while the second dose (MCV2) is administered at 15 months. Achieving high coverage of both doses is essential for ensuring adequate immunity within the population.<sup>15</sup>

#### 5. Vaccine Effectiveness

Vaccine effectiveness refers to the ability of a vaccine to prevent disease under real-world conditions. While clinical trials show high efficacy of the measles vaccine (around 85–95% after one dose and up to 97–99% after two doses), effectiveness in the field may vary due to several factors.

Factors influencing vaccine effectiveness include:

- Age at vaccination
- Nutritional status of the child
- Presence of maternal antibodies
- Cold chain maintenance
- Timing and completeness of vaccination

Studies have shown that children who receive both doses of the vaccine are significantly less likely to develop measles compared to those who are partially vaccinated or unvaccinated.

#### 6. Factors Affecting Measles Vaccination Coverage

##### 6.1 Socioeconomic Factors

Socioeconomic status plays a significant role in determining access to vaccination services. Families with low income and limited education are less likely to complete the full immunization schedule. Financial constraints, transportation issues, and lack of awareness contribute to incomplete vaccination.

##### 6.2 Parental Awareness and Attitudes

Parental knowledge and beliefs about vaccination strongly influence immunization uptake. Misconceptions about vaccine safety, fear of side effects, and cultural beliefs can lead to vaccine hesitancy. Lack of awareness about the importance of completing both doses also contributes to reduced effectiveness.

##### 6.3 Healthcare System Factors

Healthcare infrastructure, availability of trained staff, and proper vaccine storage are critical for effective immunization programs. Weak cold chain systems can reduce vaccine potency, while inadequate record-keeping may result in missed doses.

##### 6.4 Nutritional Status

Malnutrition weakens the immune system and may reduce the effectiveness of vaccines. Children with poor nutritional status are more susceptible to infections, including measles, even if they have been vaccinated.

#### 7. Measles in Urban Settings

Urban areas such as Hyderabad present unique challenges for immunization programs. High population density, migration, and informal settlements can make it difficult to ensure complete vaccination coverage. In areas like Qasimabad, disparities in healthcare access and

awareness may lead to variations in immunization status.

Rapid urbanization often results in overcrowded living conditions, which facilitate the spread of infectious diseases like measles. Additionally, migrant populations may miss routine vaccinations, increasing the risk of outbreaks.

## 8. Role of Nurses in Immunization

Nurses play a vital role in the success of immunization programs. Their responsibilities include vaccine administration, maintaining the cold chain, educating parents, and monitoring adverse events. As frontline healthcare providers, nurses are in a unique position to influence parental attitudes and improve vaccination uptake.

Effective communication by nurses can help address misconceptions and encourage timely vaccination. Community outreach programs led by nurses can also improve awareness and accessibility of immunization services.<sup>16</sup>

## 9. Previous Studies on Measles Vaccine Effectiveness

Several studies have evaluated the effectiveness of measles vaccination in different settings. Research indicates that two doses of the measles vaccine provide high levels of protection, significantly reducing the incidence of the disease.

Studies conducted in developing countries have shown that incomplete vaccination and delays in receiving doses are major contributors to measles outbreaks. Additionally, research highlights the importance of maintaining high vaccination coverage to achieve herd immunity.

In Pakistan, limited studies have focused on the real-world effectiveness of measles vaccination at the community level. Most research emphasizes vaccination coverage rather than outcomes, creating a gap in knowledge that needs to be addressed.<sup>17</sup>

## 10. Gap in Literature

Despite extensive research on measles vaccination, there is a lack of localized studies assessing vaccine effectiveness in specific

communities such as Qasimabad, Hyderabad. Existing data do not adequately address the relationship between vaccination status and actual disease occurrence among children under five years of age.

This gap highlights the need for community-based research to evaluate vaccine effectiveness and identify factors influencing immunization outcomes. Such studies are essential for improving public health strategies and reducing the burden of measles.

## 11. Summary of Literature

The literature indicates that measles remains a significant public health concern despite the availability of an effective vaccine. Vaccination programs have reduced disease incidence, but challenges such as incomplete coverage, poor awareness, and healthcare system limitations continue to affect outcomes.

Vaccine effectiveness is influenced by multiple factors, including vaccination timing, nutritional status, and healthcare infrastructure. Children under five years are particularly vulnerable, making it essential to ensure complete and timely immunization.

There is a clear need for localized studies to assess the effectiveness of measles vaccination in specific populations. This study aims to fill this gap by evaluating vaccine effectiveness among children under five years in Qasimabad, Hyderabad.

## RESEARCH METHODOLOGY

### Study Design

This study was conducted using a **descriptive cross-sectional research design**. The purpose of adopting this design was to assess the prevalence and associated factors among children under five years of age within a defined time period. A cross-sectional approach allows the researcher to collect data at a single point in time and is appropriate for analyzing the current health status and related variables in a population.

### Study Setting

The study was carried out in **Qasimabad (Urban), Hyderabad**, a densely populated urban area. Qasimabad consists of various residential

neighborhoods with diverse socio-economic backgrounds. The selection of this setting was based on accessibility, availability of participants, and its representation of an urban population.

### Study Population

The target population of this study included **children aged 0–59 months (under five years)** residing in Qasimabad, Hyderabad, during the study period of three months.

According to estimated demographic data, the total number of children under five years in this area during the study period was approximately 10,500

Determining an appropriate sample size is an essential step in research to ensure that the findings are reliable, valid, and representative of the target population. For this purpose, a standard statistical method was applied.

### Sample Size Formula

The sample size for this study was calculated using **Slovin's formula**, which is commonly used when the total population size is known but the behavior or variability of the population is not fully established.

$$n = \frac{N}{1 + Ne^2}$$

### Where:

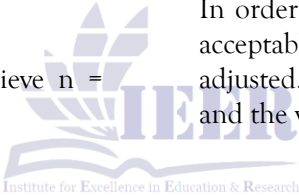
(n) = Sample size

(N) = Population size = 10,500

(e) = Margin of error (adjusted to achieve n = 160)

### Calculation

In order to obtain a manageable and statistically acceptable sample size, the margin of error was adjusted. The required sample size was set at 160, and the value of e was calculated as follows:


$$\begin{aligned} 160 &= \frac{10,500}{1 + 10,500 \times e^2} \\ 1 + 10,500 \times e^2 &= \frac{10,500}{160} \\ 1 + 10,500 \times e^2 &= 65.625 \\ 10,500 \times e^2 &= 64.625 \\ e^2 &= \frac{64.625}{10,500} \approx 0.00615 \\ e &\approx 0.0784 \text{ (7.84\%)} \end{aligned}$$

### Final Sample Size

Based on the above calculation, by setting the margin of error to approximately 7.8%, the final sample size obtained using Slovin's formula is:

- **n = 160 children**

This sample size is considered adequate to represent the study population and allows for meaningful statistical analysis.

### Data Collection Tool

Data were collected using a **structured questionnaire** developed specifically for the study on Measles Vaccination Effectiveness among Children Under Five Years of Age in Qasimabad (Urban), Hyderabad.

The questionnaire was designed to obtain comprehensive and relevant information and included the following sections:

- **Demographic information** (age of child, gender, parental education, and family background)
- **Vaccination status** (history of measles vaccination, number of doses received, and vaccination card verification where available)
- **Health-related variables** (history of measles infection, symptoms, and previous illness)
- **Risk factors** (nutritional status, living conditions, and access to healthcare services)
- **Caregiver awareness** (knowledge about measles vaccination and its importance)

The questionnaire was prepared in **simple and clear language** to ensure easy understanding by parents or caregivers. It was designed in a way to minimize confusion and obtain accurate responses.

Where necessary, the researcher assisted respondents in understanding the questions to ensure the reliability and validity of the collected data.

**Summary**

Population (0-59 months, 3-month period): 10,500 children  
 Sample size for the study: 160 children  
 Margin of error: 7.8%

This calculated sample size is sufficient for conducting **descriptive and inferential statistical analysis using SPSS**. It ensures that the study findings are reasonably accurate while remaining feasible within the available time and resources. The selected sample provides a balanced approach between precision and practicality, making it suitable for this research study.



**RESULTS & DISCUSSION**

**Age of Respondent**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<20	73	45.6	45.6	45.6
	21 to 30	36	22.5	22.5	68.1
	31-40	28	17.5	17.5	85.6
	>40	23	14.4	14.4	100.0
	Total	160	100.0	100.0	

**Table 1: Age of Respondents**

This table shows the age distribution of respondents. Out of 160 participants, the majority (45.6%) were below 20 years of age. About 22.5% respondents were between 21-30 years, 17.5% were between 31-40 years, and 14.4% were above 40 years. This indicates that most respondents were young individuals.

**Relation with Child?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mother	114	71.3	71.3	71.3
	Father	46	28.7	28.7	100.0

Total	160	100.0	100.0	
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**Table 2: Relation with Child**

The table indicates that most respondents were mothers (71.3%), while fathers constituted 28.7% of the sample. This shows that mothers were more actively involved in child-related health matters.

**Religion of Respondent/**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Muslim	114	71.3	71.3	71.3
	Non-Muslim	46	28.7	28.7	100.0
	Total	160	100.0	100.0	

**Table 3: Religion of Respondents**

According to the table, 71.3% of respondents were Muslims, while 28.7% were non-Muslims, reflecting the dominant religious composition of the study population.

**Gender of Respondent**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	96	60.0	60.0	60.0
	Female	64	40.0	40.0	100.0
	Total	160	100.0	100.0	

**Table 4: Gender of Respondents**

The table shows that 60% of respondents were male and 40% were female, indicating a higher participation of males in the study.

**Marital Status**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	25	15.6	15.6	15.6
	Married	66	41.3	41.3	56.9
	Separated	24	15.0	15.0	71.9
	Divorced	26	16.3	16.3	88.1
	Widow	19	11.9	11.9	100.0
	Total	160	100.0	100.0	

**Table 5: Marital Status**

Most respondents were married (41.3%). Other categories included divorced (16.3%), separated (15.0%), single (15.6%), and widowed (11.9%). This shows a diverse marital background among participants.

**Educational status of Father/House Hold of Child**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uneducated	25	15.6	15.6	15.6
	Primary	28	17.5	17.5	33.1
	Secondary	31	19.4	19.4	52.5
	Higher Secondary	23	14.4	14.4	66.9
	Graduate	28	17.5	17.5	84.4
	Post Graduate	25	15.6	15.6	100.0
	Total	160	100.0	100.0	

**Table 6: Education of Father/Household Head**

The educational status shows that 19.4% had secondary education, followed by 17.5% each in primary and graduate levels. About 15.6% were uneducated and the same percentage were postgraduates. This reflects a mixed educational background.

**Occupation of father of child?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	64	40.0	40.0	40.0
	Unemployed	36	22.5	22.5	62.5
	Self Employed	28	17.5	17.5	80.0
	Govt. Employed	15	9.4	9.4	89.4
	Private Service	17	10.6	10.6	100.0
	Total	160	100.0	100.0	

**Table 7: Occupation of Father**

The majority of fathers were students (40%), followed by unemployed (22.5%), self-employed (17.5%), private employees (10.6%), and government employees (9.4%). This indicates economic diversity.

**Education of Mother of Child**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uneducated	25	15.6	15.6	15.6
	Primary	33	20.6	20.6	36.3
	Secodary	32	20.0	20.0	56.3
	Higher Secondary	31	19.4	19.4	75.6
	Graduate	24	15.0	15.0	90.6
	Post Graduate	15	9.4	9.4	100.0
	Total	160	100.0	100.0	

**Table 8: Education of Mother**

Most mothers had primary (20.6%) or secondary (20.0%) education. A smaller proportion were graduates (15%) or postgraduates (9.4%), while 15.6% were uneducated.

**Occupation of Mother of Child**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	52	32.5	32.5	32.5
	Unemployed	37	23.1	23.1	55.6
	Self Employed	20	12.5	12.5	68.1
	Govt. Employed	31	19.4	19.4	87.5
	Private Service	20	12.5	12.5	100.0
	Total	160	100.0	100.0	

**Table 9: Occupation of Mother**

Most mothers were students (32.5%) or unemployed (23.1%). Others were government employees (19.4%), self-employed (12.5%), or working in private jobs (12.5%).

**Numbers of Prenatal Visits**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<2	69	43.1	43.1	43.1
	>3	91	56.9	56.9	100.0
	Total	160	100.0	100.0	

**Table 10: Prenatal Visits**

More than half of respondents (56.9%) had more than 3 prenatal visits, while 43.1% had less than 2 visits, indicating moderate utilization of antenatal care services.

**Numbers of Postnatal Visits**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<2	107	66.9	66.9	66.9
	>3	53	33.1	33.1	100.0
	Total	160	100.0	100.0	

**Table 11: Postnatal Visits**

A majority (66.9%) had fewer than 2 postnatal visits, while only 33.1% had more than 3 visits, suggesting low postnatal care utilization.

Monthly Income Level of Parents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 15000	56	35.0	35.0	35.0
	15000-70000	49	30.6	30.6	65.6
	More than 70000	54	33.8	33.8	99.4
	4.00	1	.6	.6	100.0
	Total	160	100.0	100.0	

Table 12: Monthly Income

About 35% had income less than 15,000 PKR, 30.6% between 15,000–70,000 PKR, and 33.8% above 70,000 PKR, showing varied socioeconomic status.

Gender of Child

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Boy	98	61.3	61.3	61.3
	Girl	62	38.8	38.8	100.0
	Total	160	100.0	100.0	

Table 13: Gender of Child

Most children were boys (61.3%), while girls constituted 38.8% of the sample.

Numbers of Siblings?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	29	18.1	18.1	18.1
	1	27	16.9	16.9	35.0
	2	31	19.4	19.4	54.4
	3	22	13.8	13.8	68.1
	4	23	14.4	14.4	82.5
	5	28	17.5	17.5	100.0
	Total	160	100.0	100.0	

Table 14: Number of Siblings

The number of siblings varied, with the highest percentage (19.4%) having 2 siblings, followed by 17.5% having 5 siblings. This indicates relatively large family sizes.

Vaccine card retention?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	119	74.4	74.4	74.4
	No	36	22.5	22.5	96.9
	Missing	5	3.1	3.1	100.0
	Total	160	100.0	100.0	

**Table 15: Vaccine Card Retention**

Most respondents (74.4%) retained vaccination cards, while 22.5% did not, and 3.1% responses were missing.

Age of Child?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-6 Weeks	64	40.0	40.0	40.0
	7-10 Weeks	29	18.1	18.1	58.1
	11-14 Weeks	34	21.3	21.3	79.4
	14-48 Weeks	33	20.6	20.6	100.0
	Total	160	100.0	100.0	

**Table 16: Age of Child**

Most children (40%) were aged 0-6 weeks, followed by 21.3% aged 11-14 weeks, 20.6% aged 14-48 weeks, and 18.1% aged 7-10 weeks.

Immunization Status/Measles

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	54	33.8	33.8	33.8
	No	106	66.3	66.3	100.0
	Total	160	100.0	100.0	

**Table 17: Measles Immunization Status**

Only 33.8% of children were immunized against measles, while 66.3% were not, indicating low vaccination coverage.

Vaccination Status?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Vaccinated	39	24.4	24.4	24.4
	Partially Vaccinated	37	23.1	23.1	47.5
	Vaccinated According to Age	47	29.4	29.4	76.9

Fully Vaccinated	36	22.5	22.5	99.4
Partially Vaccinated	1	.6	.6	100.0
Total	160	100.0	100.0	

**Table 18: Overall Vaccination Status**

29.4% were vaccinated according to age, 24.4% were not vaccinated, 23.1% were partially vaccinated, and 22.5% were fully vaccinated.

**Vaccine Received?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MR	56	35.0	35.0	35.0
	MMR	49	30.6	30.6	65.6
	Measles	54	33.8	33.8	99.4
	4.00	1	.6	.6	100.0
	Total	160	100.0	100.0	

**Table 19: Type of Vaccine Received**

35% received MR vaccine, 33.8% measles vaccine, and 30.6% MMR vaccine.

**MR doses received during SIAs up to 5 Years?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	96	60.0	60.0	60.0
	No	64	40.0	40.0	100.0
	Total	160	100.0	100.0	

**Table 20: MR Doses during SIAs**

60% received MR doses during campaigns, while 40% did not.

**If Yes MR given at?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	EPI Center	69	43.1	43.1	43.1
	During SIAs Campaign	68	42.5	42.5	85.6
	All of these	23	14.4	14.4	100.0
	Total	160	100.0	100.0	

**Table 21: Place of MR Vaccination**

43.1% received MR vaccine from EPI centers, 42.5% during campaigns, and 14.4% from all sources.

**Known about Expended program on Immunization?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	96	60.0	60.0	60.0
	No	64	40.0	40.0	100.0
	Total	160	100.0	100.0	

**Table 22: Awareness about EPI**

60% of respondents were aware of EPI, while 40% were not.

**Distance of EPI Center**

		Frequency	Percent	Valid Percent	Cumulative Percent
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Valid	Under 1 KM	111	69.4	69.4	69.4
	1 to 2 KM	34	21.3	21.3	90.6
	More than 2 KM	15	9.4	9.4	100.0
	Total	160	100.0	100.0	

**Table 23: Distance to EPI Center**

Most respondents (69.4%) lived within 1 km of an EPI center, indicating good accessibility.

**Vaccination Visit to Your Colony/Society/Village?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	107	66.9	66.9	66.9
	No	53	33.1	33.1	100.0
	Total	160	100.0	100.0	

**Table 24: Vaccination Visits**

66.9% reported vaccination visits in their area, while 33.1% did not.

**Myth/belief about MR?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vaccine will provide more protection against disease	69	43.1	43.1	43.1
	Vaccine will provide no protection against disease	68	42.5	42.5	85.6
	Don't Know	23	14.4	14.4	100.0
	Total	160	100.0	100.0	

**Table 25: Myth/Beliefs about MR**

43.1% believed vaccines provide protection, while 42.5% believed they do not, showing misinformation.

**Is it Better to give MR vaccination to your child?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	80	50.0	50.0	50.0
	No	80	50.0	50.0	100.0
	Total	160	100.0	100.0	

**Table 26: Opinion about MR Vaccination**

50% supported MR vaccination, while 50% did not, indicating divided opinions.

**Source about myth/belief?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Parent	42	26.3	26.3	26.3
	Friends	38	23.8	23.8	50.0
	Relatives	42	26.3	26.3	76.3
	Neighbors	36	22.5	22.5	98.8
	5.00	1	.6	.6	99.4
	6.00	1	.6	.6	100.0
	Total	160	100.0	100.0	

**Table 27: Source of Myths**

Myths were mainly spread by parents (26.3%) and relatives (26.3%), followed by friends and neighbors.

**Informed about other vaccine?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	66	41.3	41.3	41.3
	No	64	40.0	40.0	81.3
	Don't know	30	18.8	18.8	100.0
	Total	160	100.0	100.0	

**Table 28: Information about Other Vaccines**

41.3% were informed, 40% were not, and 18.8% were unsure.

**Not Known about EPI Center?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	96	60.0	60.0	60.0
	No	64	40.0	40.0	100.0
	Total	160	100.0	100.0	

**Table 29: Awareness about EPI Center**A total of 96 (60.0%) respondents were aware of the EPI center, while 64 (40.0%) had no knowledge about it. This indicates that although the majority had awareness, a considerable proportion still lacked information.

**Time taken to reach Health Facility**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	89	55.6	55.6	55.6
	No	71	44.4	44.4	100.0
	Total	160	100.0	100.0	

**Table 30: Time Taken to Reach Health Facility**A total of 89 (55.6%) respondents reported that reaching the health facility was manageable, whereas 71 (44.4%) faced difficulty. This reflects accessibility issues for a significant portion of the population.

**Rough/Rude attitude of vaccinator**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	105	65.6	65.6	65.6
	No	55	34.4	34.4	100.0
	Total	160	100.0	100.0	

**Table 31: Attitude of Vaccinator (Rough/Rude Behavior)**A majority of respondents, 105 (65.6%), experienced rude behavior from vaccinators, while 55 (34.4%) did not. This suggests that healthcare workers' attitude may negatively influence vaccination uptake.

**Not Access of EPI**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	103	64.4	64.4	64.4
	No	57	35.6	35.6	100.0
	Total	160	100.0	100.0	

**Table 32: Access to EPI Services**103 (64.4%) respondents reported lack of access to EPI services, whereas 57 (35.6%) had access. This highlights accessibility as a major barrier.

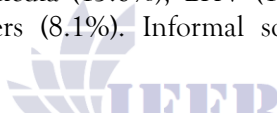
Source of information about MR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Doctor	21	13.1	13.1	13.1

Too Busy, Don't Priorities

LHV	22	13.8	13.8	26.9
Vaccinator	27	16.9	16.9	43.8
Polio Campaign Vaccinator	18	11.3	11.3	55.0
Poster/Banner	13	8.1	8.1	63.1
Mass Media	25	15.6	15.6	78.8
Neighbourhood	34	21.3	21.3	100.0
Total	160	100.0	100.0	

**Table 33: Source of Information about MR Vaccine** Neighborhood was the most common source (21.3%), followed by vaccinators (16.9%), mass media (15.6%), LHV (13.8%), doctors (13.1%), polio campaign vaccinators (11.3%), and posters/banners (8.1%). Informal sources appear to play a major role in information dissemination.



Negative Family/Friends Influence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	33	20.6	20.6	20.6
	Disagree	32	20.0	20.0	40.6
	Neutral	34	21.3	21.3	61.9
	Agree	37	23.1	23.1	85.0
	Strongly Disagree	24	15.0	15.0	100.0
	Total	160	100.0	100.0	

**Table 34: Negative Influence of Family/Friends** 23.1% agreed and 15.0% strongly agreed that family or friends had a negative influence, while 40.6% disagreed or strongly disagreed. This shows mixed social influence on vaccination decisions.

Recent Vaccinator Scars

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	2.5	2.5	2.5
	Disagree	18	11.3	11.3	13.8
	Neutral	33	20.6	20.6	34.4
	Agree	59	36.9	36.9	71.3
	Strongly Disagree	46	28.7	28.7	100.0
	Total	160	100.0	100.0	

**Table 35: Concern about Vaccination Scars** 36.9% agreed and 28.7% strongly agreed that vaccination scars were a concern. This indicates fear of physical marks as a barrier.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	2.5	2.5	2.5
	Disagree	15	9.4	9.4	11.9
	Neutral	32	20.0	20.0	31.9
	Agree	57	35.6	35.6	67.5
	Strongly Disagree	52	32.5	32.5	100.0
	Total	160	100.0	100.0	

**Table 36: Being Too Busy / Lack of Priority** 35.6% agreed and 32.5% strongly agreed that being busy led to not prioritizing vaccination. Time constraints are an important factor.

**Due to side effects**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	13	8.1	8.1	8.1
	Disagree	23	14.4	14.4	22.5
	Neutral	32	20.0	20.0	42.5
	Agree	51	31.9	31.9	74.4
	Strongly Disagree	41	25.6	25.6	100.0
	Total	160	100.0	100.0	

**Table 37: Concern about Side Effects** 31.9% agreed and 25.6% strongly agreed that fear of side effects influenced their decisions. This reflects a major concern regarding vaccine safety.



**Delay vaccine until older**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	36	22.5	22.5	22.5
	Disagree	36	22.5	22.5	45.0
	Neutral	34	21.3	21.3	66.3
	Agree	32	20.0	20.0	86.3
	Strongly Disagree	22	13.8	13.8	100.0
	Total	160	100.0	100.0	

**Table 38: Delay Vaccination Until Older Age** 20.0% agreed with delaying vaccination, while 45.0% disagreed. Most respondents do not support delaying vaccination.

**Anxious about vaccine**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	33	20.6	20.6	20.6
	Disagree	39	24.4	24.4	45.0
	Neutral	34	21.3	21.3	66.3
	Agree	30	18.8	18.8	85.0
	Strongly Disagree	24	15.0	15.0	100.0
	Total	160	100.0	100.0	

**Table 39: Anxiety about Vaccination** 18.8% agreed and 15.0% strongly agreed that they felt anxious, while 45.0% disagreed. This shows moderate levels of anxiety.

Not awareness of vaccination

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	2.5	2.5	2.5
	Neutral	18	11.3	11.3	13.8
	Agree	69	43.1	43.1	56.9
	Strongly Disagree	69	43.1	43.1	100.0
	Total	160	100.0	100.0	

**Table 40: Lack of Awareness about Vaccination** 43.1% agreed that lack of awareness exists, while another 43.1% strongly disagreed. This indicates divided opinions

Changed mind because of rumors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	30	18.8	18.8	18.8
	Disagree	36	22.5	22.5	41.3
	Neutral	38	23.8	23.8	65.0
	Agree	32	20.0	20.0	85.0
	Strongly Disagree	24	15.0	15.0	100.0
	Total	160	100.0	100.0	

**Table 41: Influence of Rumors on Decision Making** 20.0% agreed that rumors influenced their decisions, whereas 41.3% disagreed. Rumors affect some but not all individuals.

Illness due to Vaccine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	13	8.1	8.1	8.1
	Disagree	24	15.0	15.0	23.1
	Neutral	33	20.6	20.6	43.8
	Agree	50	31.3	31.3	75.0
	Strongly Disagree	40	25.0	25.0	100.0
	Total	160	100.0	100.0	

**Table 42: Perception of Illness Due to Vaccine** 31.3% agreed and 25.0% strongly agreed that vaccines can cause illness. This highlights the presence of misconceptions.

CONCLUSION

This study was conducted to assess the effectiveness of measles vaccination among children under five years of age in Qasimabad, Hyderabad. The findings of this research highlight significant gaps in immunization coverage, vaccine uptake, and factors influencing vaccination effectiveness within the study population. Despite the availability of vaccination services through the Expanded Programme on Immunization (EPI), the results indicate that measles remains a potential public health threat

due to incomplete and inconsistent vaccination practices.

The demographic characteristics of the respondents revealed that the majority were young caregivers, predominantly mothers, indicating that maternal involvement plays a crucial role in child healthcare decisions. However, variations in educational status, occupation, and socioeconomic conditions suggest that these factors significantly influence health-seeking behaviors and vaccination practices. Lower levels of parental education and unstable economic conditions may contribute to

inadequate awareness and poor adherence to immunization schedules.

One of the most critical findings of this study is the low level of measles immunization among children. Only a small proportion of children were fully immunized, while a considerable number were either partially vaccinated or completely unvaccinated. This indicates that although vaccination services are available, their utilization is suboptimal. Partial vaccination, in particular, poses a serious concern, as it does not provide complete immunity and leaves children vulnerable to infection.

The study also revealed that a significant proportion of children did not receive vaccination according to the recommended schedule. Delayed or missed doses reduce the overall effectiveness of the vaccine and increase the risk of measles outbreaks. This finding is consistent with previous studies, which emphasize that timely administration of both doses of the measles vaccine is essential for achieving optimal protection.

Another important observation is that, despite relatively good physical access to healthcare facilities (as most respondents lived within close proximity to EPI centers), vaccination coverage remained low. This suggests that accessibility alone is not sufficient to ensure effective immunization. Other barriers, such as lack of awareness, misconceptions about vaccines, cultural beliefs, and fear of side effects, may play a significant role in limiting vaccine uptake.

Parental awareness about immunization programs was found to be moderate, with a notable proportion of respondents lacking knowledge about the importance of complete vaccination. This lack of awareness can lead to missed opportunities for immunization and contributes to the persistence of vaccine-preventable diseases such as measles. Furthermore, misconceptions and myths surrounding vaccines may discourage parents from completing the vaccination schedule.

The findings also highlight the role of healthcare system factors in influencing vaccine effectiveness. Issues such as inadequate follow-up, poor communication between healthcare

providers and caregivers, and possible gaps in record-keeping can result in incomplete vaccination. Although vaccination campaigns and outreach programs were reported in many areas, their impact appears to be limited, suggesting the need for more effective implementation and monitoring.

Socioeconomic factors also emerged as significant determinants of vaccination status. Families with lower income levels may face challenges such as transportation costs, competing priorities, and limited access to reliable health information. Additionally, larger family sizes may make it more difficult for caregivers to ensure timely vaccination for all children, further contributing to incomplete immunization coverage.

The study further indicates that postnatal care utilization was relatively low among respondents. Since postnatal visits are critical opportunities for health education and vaccination counseling, limited utilization of these services may negatively affect immunization outcomes. Strengthening postnatal care services and integrating immunization education into routine maternal and child healthcare can help improve vaccination coverage.

In terms of vaccine effectiveness, the study suggests that the protective impact of measles vaccination is compromised by incomplete coverage and irregular vaccination practices. While vaccines are inherently effective, their real-world performance depends on proper administration, adherence to schedules, and adequate coverage within the population. The presence of unvaccinated and partially vaccinated children reduces herd immunity and increases the risk of disease transmission.

Overall, the findings of this study demonstrate that measles vaccination effectiveness in the study area is influenced by a combination of individual, social, and healthcare system factors. The persistence of gaps in immunization coverage indicates that current strategies are insufficient to achieve optimal protection against measles.

This study also highlights the critical role of nurses and healthcare professionals in improving immunization outcomes. As frontline healthcare providers, nurses are in a unique position to

educate caregivers, address misconceptions, and ensure proper vaccine administration. Strengthening the capacity of healthcare workers and enhancing their communication skills can significantly improve vaccination uptake, while measles vaccination remains a highly effective preventive measure, its success in real-world settings is dependent on multiple factors. The study findings emphasize the need for comprehensive and targeted interventions to address barriers to vaccination and improve immunization practices. Increasing awareness, strengthening healthcare services, and ensuring adherence to vaccination schedules are essential steps toward enhancing vaccine effectiveness.

The study underscores the importance of continuous monitoring and evaluation of immunization programs at the community level. Localized research, such as this study, provides valuable insights into specific challenges and helps in designing context-specific interventions. Addressing these challenges is crucial for reducing the burden of measles and achieving long-term public health goals.

Ultimately, improving measles vaccination effectiveness requires a collaborative effort involving healthcare providers, policymakers, and the community. By addressing the identified barriers and strengthening immunization strategies, it is possible to enhance vaccination coverage, reduce disease incidence, and improve the overall health and well-being of children under five years of age.

In addition to the identified factors, the study also reflects underlying systemic and behavioral gaps that affect the overall success of immunization programs. Although a significant number of respondents reported the availability of vaccination services in their locality, the inconsistency in vaccination uptake suggests that service availability does not always translate into service utilization. This gap between availability and utilization is often influenced by a combination of individual perceptions, family priorities, and community-level influences.

The role of maternal education is particularly important in this context. Mothers with higher levels of education are generally more likely to

understand the importance of timely vaccination and adhere to immunization schedules. In contrast, limited education may lead to misunderstandings, reliance on myths, and reduced confidence in healthcare services. Therefore, maternal literacy and health education should be considered key components in improving vaccination outcomes.

Furthermore, the study highlights the impact of cultural beliefs and societal norms on vaccination practices. In some communities, traditional beliefs and misinformation may discourage caregivers from seeking vaccination services. Fear of adverse effects, misconceptions about vaccine safety, and reliance on informal sources of information can significantly hinder immunization efforts. These findings emphasize the need for culturally sensitive health education programs that address community-specific concerns and beliefs.

Another critical factor identified in this study is the issue of incomplete follow-up in vaccination schedules. Many children who received the first dose of the vaccine did not complete the second dose, which is essential for achieving full immunity. This indicates a lack of effective tracking systems and reminder mechanisms within the healthcare system. Strengthening follow-up strategies, such as reminder calls, community health worker visits, and digital record systems, can help ensure completion of vaccination schedules.

The findings also suggest that healthcare communication strategies need to be improved. While some respondents were aware of immunization programs, this awareness did not always translate into action. This indicates that the quality and effectiveness of communication may be inadequate. Healthcare providers should focus not only on delivering information but also on ensuring that caregivers understand and value the importance of vaccination.

Additionally, the study reveals that postnatal care services are underutilized, which represents a missed opportunity for promoting immunization. Postnatal visits provide an ideal platform for educating mothers about child health, vaccination schedules, and disease prevention.

Enhancing the integration of immunization counseling into postnatal care services can significantly improve vaccination coverage.

The socioeconomic diversity observed in the study population also plays a crucial role in shaping health behaviors. Families with limited financial resources may prioritize immediate needs over preventive healthcare, leading to delayed or missed vaccinations. Moreover, parents with unstable employment or demanding work schedules may find it difficult to attend vaccination sessions. Addressing these barriers requires flexible service delivery models, such as extended clinic hours and mobile vaccination units.

Another important aspect highlighted by the study is the role of community-based interventions. The presence of vaccination campaigns and outreach programs in the study area indicates ongoing efforts to improve immunization coverage. However, the persistence of low vaccination rates suggests that these interventions may not be sufficiently effective or well-targeted. Strengthening community engagement, involving local leaders, and utilizing community health workers can enhance the reach and impact of these programs.

The study also points to the importance of maintaining proper vaccine storage and handling practices. Although not directly measured, factors such as cold chain maintenance are known to affect vaccine potency and effectiveness. Ensuring that vaccines are stored and transported under appropriate conditions is essential for achieving the desired level of protection.

Moreover, the findings underscore the importance of adopting a holistic approach to immunization programs. Improving vaccination coverage requires not only the availability of vaccines but also the integration of education, communication, accessibility, and monitoring systems. A multi-dimensional strategy that addresses both demand-side and supply-side factors is necessary to achieve sustainable improvements in immunization outcomes.

From a public health perspective, the low level of vaccination coverage observed in this study poses a significant risk for measles outbreaks. Measles is

a highly contagious disease, and even a small number of unvaccinated individuals can lead to rapid transmission within the community. The presence of partially vaccinated children further exacerbates this risk, as they may not have adequate immunity.

The concept of herd immunity is particularly relevant in this context. For measles, a high level of immunization coverage (typically above 90–95%) is required to prevent outbreaks. The findings of this study indicate that the current level of vaccination coverage in the study area is insufficient to achieve herd immunity, thereby increasing the vulnerability of the population.

The study also emphasizes the need for continuous monitoring and evaluation of immunization programs. Regular assessment of vaccination coverage, identification of gaps, and timely implementation of corrective measures are essential for improving program effectiveness. Data-driven decision-making can help healthcare authorities allocate resources more efficiently and design targeted interventions.

In addition, the involvement of stakeholders at all levels is crucial for the success of immunization programs. Government agencies, healthcare providers, non-governmental organizations, and community members must work collaboratively to address the barriers identified in this study. Strengthening partnerships and fostering community participation can lead to more sustainable and effective interventions.

The findings of this study have important implications for nursing practice. Nurses play a central role in immunization programs and are often the primary source of information for caregivers. Enhancing the training and capacity of nurses in communication, counseling, and community outreach can significantly improve vaccination uptake. Nurses can also act as advocates for immunization and contribute to building trust within the community.

In conclusion, this study provides a comprehensive understanding of the factors affecting measles vaccination effectiveness among children under five years of age in Qasimabad, Hyderabad. The findings highlight significant

gaps in vaccination coverage and identify multiple barriers at the individual, community, and healthcare system levels.

Addressing these barriers requires a coordinated and multi-faceted approach that includes improving awareness, strengthening healthcare services, enhancing communication strategies, and ensuring adherence to vaccination schedules. Special attention should be given to vulnerable populations, including low-income families and those with limited education.

The study reinforces the importance of vaccination as a critical public health intervention and underscores the need for continuous efforts to improve its effectiveness. By implementing targeted strategies and addressing the identified challenges, it is possible to enhance immunization coverage, reduce the incidence of measles, and improve child health outcomes.

Ultimately, the success of immunization programs depends on the collective efforts of healthcare providers, policymakers, and the community. Strengthening these efforts will not only help in controlling measles but also contribute to the broader goal of improving public health and achieving sustainable development.

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