

Research Article

Level of Compliance with the Vaccination Scheme in Children Under 1 Year

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Abstract

Background: Childhood vaccination is one of the most effective public health interventions for preventing infectious diseases and reducing infant morbidity and mortality. Despite the availability of national immunization programs, incomplete or delayed vaccination schedules remain a major challenge, particularly in low-resource settings. Parental misconceptions, vaccine hesitancy, limited access to healthcare services, and socioeconomic factors contribute to poor vaccination adherence. **Objective:** To determine the level of adherence to the vaccination schedule among children younger than one year of age. **Materials and Methods:** A descriptive, observational, cross-sectional, prospective study was conducted. Vaccination records from 260 children under one year of age were reviewed to evaluate adherence to the national immunization schedule. Vaccination status was classified according to predefined adherence categories based on the completeness and timeliness of the recommended vaccines. **Results:** Among the 260 children included, 141 (54.2%) demonstrated significant non-adherence to the vaccination schedule, whereas 119 (45.8%) showed poor adherence. Overall, adherence to the recommended immunization schedule was below expected levels. **Conclusions:** Adherence to the vaccination schedule among children younger than one year was insufficient. These findings highlight the need to strengthen educational interventions for parents, improve access to vaccination services, and implement strategies that promote timely childhood immunization in primary healthcare settings.

Keywords

Vaccination, Infants, Childhood Immunization, Vaccination Schedule, Adherence

1. Introduction

Vaccination is one of the most effective and cost-efficient public health interventions for preventing infectious diseases, reducing childhood morbidity and mortality, and improving life expectancy worldwide. Vaccines stimulate the immune system to develop protective immunity against specific pathogens, thereby decreasing the severity of disease and preventing outbreaks of vaccine-preventable illnesses such as poliomyelitis, measles, pertussis, and diphtheria [1].

According to the World Health Organization (WHO), routine childhood immunization prevents approximately 3.5 to 5 million deaths each year from diseases including diphtheria, tetanus, pertussis, influenza, and measles [2]. Nevertheless, vaccination coverage declined in several countries during and after the COVID-19 pandemic, leaving millions of children at increased risk for vaccine-preventable diseases [3]. These declines have highlighted the importance of strengthening im-

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munization programs and ensuring timely completion of recommended vaccination schedules.

Several studies have identified multiple factors associated with incomplete vaccination schedules. These include parental vaccine hesitancy, misinformation regarding vaccine safety, concerns about adverse events, limited knowledge of immunization schedules, socioeconomic inequalities, barriers to healthcare access, and missed opportunities for vaccination during healthcare visits [4-7]. Although most post-vaccination adverse events are mild and self-limiting, misconceptions about vaccine safety continue to influence parental decision-making and reduce vaccine acceptance.

Primary healthcare plays a fundamental role in improving vaccination coverage. Family physicians and primary care professionals are responsible not only for disease treatment but also for preventive care through health education, identification of risk factors, and promotion of timely immunization. Effective communication between healthcare professionals and parents is essential to address concerns, improve vaccine confidence, and increase adherence to national immunization schedules [8].

Although numerous international studies have evaluated childhood vaccination coverage, information regarding adherence to vaccination schedules in children younger than one year remains limited in several regions of Mexico. Understanding the local magnitude of incomplete vaccination is essential for designing targeted interventions aimed at improving immunization coverage and reducing the burden of vaccine-preventable diseases.

Therefore, the aim of the present study was to determine the level of adherence to the vaccination schedule among children younger than one year of age attending a primary healthcare facility.

Vaccination adherence was classified according to the national immunization schedule. Complete adherence was defined as receiving all age-appropriate vaccines within the recommended time frame. Poor adherence was defined as the omission or delayed administration of one or more recommended vaccines, whereas significant non-adherence referred to multiple missed or delayed vaccines according to the established schedule [9]. Data were independently reviewed by two investigators, and discrepancies were resolved by consensus to ensure data accuracy.

The present study demonstrated that adherence to the childhood vaccination schedule among children younger than one year was lower than expected, with more than half of the participants presenting significant non-adherence. These findings underscore the need to strengthen immunization strategies within primary healthcare.

Educational interventions aimed at parents and caregivers, improved communication regarding vaccine safety, reminder systems, and enhanced access to vaccination services could contribute to increasing timely vaccine uptake [13]. Healthcare professionals should actively identify children with incomplete vaccination schedules and implement catch-

up vaccination strategies whenever appropriate.

The results of this study provide valuable local evidence regarding childhood vaccination adherence and may assist health authorities in designing targeted public health interventions to improve vaccination coverage and reduce the risk of vaccine-preventable diseases in vulnerable pediatric populations.

Objectives:

Identify the level of compliance with the vaccination schedule in children under 1 year.

2. Materials and Methods

A descriptive, observational, cross-sectional and prospective study was conducted from May to August 2024 in the Family Medicine Unit No. 73. Sampling was carried out for convenience, including 260 children under 1 year of age of both sexes in the vaccination records; assigned to UMF No. 73 from the calculation by estimating proportions in a finite population with 95% reliability and 5% margin of error based on the prevalence of 86% described by the National Center for Child and Adolescent Health (CNSIA) [5]. Those whose parents refused to participate were excluded by signing informed consent. Data were collected such as age, sex and the reasons why their children had not been vaccinated; this was done in order to develop a database that could be used for statistical analysis of the variables.

measles at 12 months of age; 2) Partially vaccinated: children who received at least one but not all recommended vaccines before the age of 12 months and; 3) Unvaccinated: children who did not receive any of the recommended vaccines before the age of 12 months.

The statistical analysis was descriptive and the results were expressed in frequencies, percentages, averages, modes and medians using the IBM SPSS Statistics version 26 statistical program. The development of this research project was previously authorized by the Local Committee for Research 3005 and Ethics in Health Research 3005 of the Mexican Institute of Social Security in Poza Rica Veracruz. This study and the procedures for carrying it out were in accordance with existing national and international ethical standards, the rules of the General Health Law on health research, and the Declaration of Helsinki made at the World Medical Assembly and its latest amendment.

3. Results

260 participants were included during the study period. 59.6% represent the male generation, while 40.4% represent the female generation where the distribution by age group was 170 participants (65.3%) in the range of 0 to 6 months and 90 (34.6%) from 6-12 months, with an average of 1.35 1.35 months.

When reviewing the national health card, it was identified

that 141 (54.2%) had significant non-compliance, while 119 (45.7%) showed poor compliance (Figure 1). It was also found that the vaccines with fewer applications were conjugated

pneumococcal (n=2, 0.7%), BCG and hexavalent (n=16, 6.5%, each respectively).



Figure 1. Vaccination schedule.

As to the reason why the child was not vaccinated, it was reported that 34.2% (n=89) go to the medical unit for another reason, 9.2% (n=12) due to lack of biological, 6.9% (n=9) due

to waiting for the arrival of vaccines, 6.2% (n=8) who could not wait for the application and 3.8% (n=5) because you are sick at the time of vaccination (Figure 2).

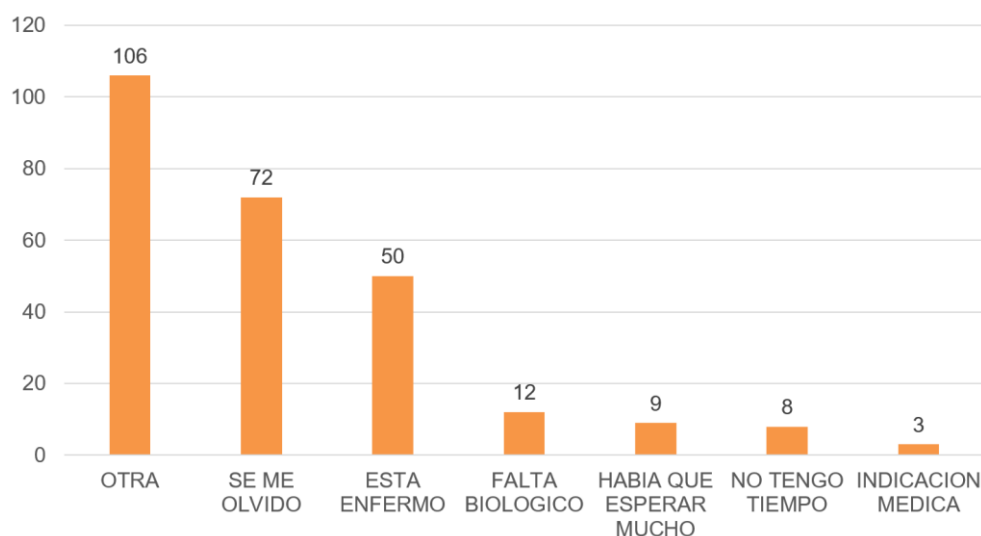


Figure 2. Reason for not vaccinating.

4. Discussion

Vaccination and vaccine resistance among high-income, highly educated people has become an important public health issue in several countries [6]. Although in highly developed countries, many sociodemographic characteristics are linked to vaccination coverage: having a single mother, a young

mother, having a large number of siblings and living in multiple households. However, when indicators of parents' socio-economic status are considered, such as level of education, household income, employment status, the results are inconsistent [7]. vaccination also affects, due to concerns about the possible interference or manipulation of commercial interests in it, which compromises the possibility of eliciting well-founded public policies from discussions with the population [10]. A review by Rainey in 2011 identified from 202 relevant

articles, we summarized 838 reasons associated with sub-vaccination; 379 (45%) were related to immunization systems, 220 (26%) with family characteristics, 181 (22%) with parental attitudes and knowledge, and 58 (7%) with limitations in communication and information related to immunization. Of the 19 reasons taken from 11 identified articles describing the unvaccinated child, 6 (32%) were related to immunization systems, 8 (42%) to parental attitudes and knowledge, 4 (21%) to family characteristics and 1 (5%) to communication and information [11]. Recently, non-socio-demographic problems on the demand side, such as awareness of the need and timing of routine childhood vaccinations, fears about some or all routine vaccinations and parents' beliefs regarding false contraindications to routine vaccinations have been reported as reasons linked to vaccination and non-vaccination of children [12]. included small groups or used secondary data, were carried out in areas with low vaccination coverage and found that low coverage was mainly related to inequity [13].

The limitations of the current study to be considered were the descriptive methodological approach and a smaller sample size. Neither are follow-up strategies or interventions evaluated on the study group, in order to assess the impact on knowledge and awareness about vaccination.

5. Conclusions

The importance of identifying non-compliance lies in the fact that when it is detected, actions can be carried out and training given to staff and the general population in order to comply with preventive care.

The level of compliance with the vaccination scheme for children under one year in UMF 73, Poza Rica, Veracruz, is poor, with a 54.2% non-compliance rate. In the present case, factors and barriers to using available vaccination services were the causes observed for non-vaccination.

Abbreviations

UMF Unidad de Medicina Familiar

Author Contributions

Mejia Belloso Isabel Teresa De La Chiquinquirá: Conceptualization, Formal Analysis, Investigation, Methodology, Project administration, Writing – original draft

Pina Salguero Elias Alberto: Supervision, Validation, Visualization, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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