An Observational Study on Attitude of Parents About Childhood Vaccination To Ensure Vaccine Safety

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***Abstract*- This study aimed to assess parents' knowledge about childhood vaccination and vaccine safety through a questionnaire-based survey. The objectives included evaluating parents' awareness of vaccine safety and benefits, identifying factors influencing their vaccination decisions, and exploring the role of healthcare professionals in shaping attitudes toward vaccination. A 16-item semi-structured questionnaire was distributed to 230 parents of children up to 15 years old, yielding 200 responses. While most parents were familiar with common vaccines, gaps in understanding specific vaccines and the recommended schedule were identified. Parents generally sought information from healthcare professionals, though some still relied on informal sources. Despite strong overall support for immunization, vaccines like Typhoid and HPV had lower uptake rates, and concerns about potential side effects, particularly the HPV vaccine, were noted. These findings underscore the need for clearer and more accessible communication from healthcare providers to address concerns and improve vaccine knowledge. Educational materials, including leaflets on vaccination safety and long-term health benefits, were distributed to enhance parental understanding and encourage informed vaccination decisions, ultimately aiming to reduce vaccine hesitancy and increase coverage.**

***Index Terms*- Childhood Vaccination, Vaccine Hesitancy, Parental Attitudes, Vaccine Schedules, Public Health Campaigns, Cross-Sectional Survey.**

I.INTRODUCTION

Childhood vaccination is a critical public health measure for preventing infectious diseases and promoting herd immunity, which protects vulnerable populations unable to be vaccinated. Despite the proven benefits, vaccine hesitancy remains a significant challenge, with parental attitudes toward vaccine safety and efficacy being crucial in determining vaccination rates. Misconceptions about vaccines, such as the false link between the MMR vaccine and autism, continue to fuel hesitancy, especially when misinformation spreads through social media and anti-vaccine groups. To address these concerns, it is essential for healthcare professionals to provide accurate, consistent, and trusted information. Vaccination schedules, recommended by organizations like the CDC and WHO, aim to ensure timely protection against diseases, and the introduction of new vaccines, such as the HPV and rotavirus vaccines, helps expand the scope of childhood immunization to safeguard against emerging diseases and improve overall public health.

National Immunization Schedule for Children

It is a government-recommended plan that outlines the timing and types of vaccines that children should receive from birth through early childhood to protect them from a range of infectious diseases.

The schedule is designed to ensure that children are immunized at the right ages to maximize their protection and prevent the spread of vaccine-preventable diseases within the community.

Eligibility	Vaccine/s
Infants & children	
At Birth	BCG, OPV – 0, Hepatitis – B
6 weeks of age	Pentavalent – 1, Rotavirus vaccine – 1, fIPV (inactivated Polio, fractional dose) – 1, OPV – 1, Pneumococcal Conjugate vaccine (PCV) – 1
10 weeks of age	Pentavalent – 2, Rotavirus vaccine – 2, OPV – 2
14 weeks of age	Pentavalent – 3, Rotavirus vaccine – 3, fIPV (inactivated Polio, fractional dose) – 2 OPV – 3, Pneumococcal Conjugate vaccine (PCV) – 2
9 – 12 months of age	Measles-Rubella – 1, PCV – booster, Vitamin A – first dose, fIPV – 3, JE* – 1
16 – 24 months of age	DPT – first Booster, OPV booster, Measles-Rubella – 2, JE* – 2, Vitamin A – second dose followed by every 6 months till 5 yr. age
5 – 6 years of age	DPT second booster
10 and 16 years of age	Td

Fig 1: National immunization schedule

Vaccine pharmacovigilance plays a vital role in monitoring the safety of vaccines post-approval,

ensuring that any adverse events are detected and managed appropriately. Through systems like passive and active surveillance, healthcare providers can track and report adverse events, helping to maintain public trust in vaccination programs. Data from clinical trials, patient reports, and surveillance systems are analysed to identify potential safety concerns, with risk assessments conducted by regulatory bodies like the FDA, EMA, and WHO. Transparent communication of risks and benefits supports informed decision-making among parents and healthcare providers, reinforcing the importance of vaccines in protecting individual and community health. By ensuring the safety and efficacy of vaccines through pharmacovigilance, we can sustain high vaccination rates and continue to fight vaccine-preventable diseases worldwide.

II.STUDY OBJECTIVE

The aim of this study is to observe and assess the attitudes of parents towards childhood vaccination and their perceptions regarding vaccine safety.

A. To understand the level of knowledge and awareness among parents about the safety and benefits of childhood vaccines.

B. To identify factors influencing parent's decisions about vaccinating their children.

C. To explore the role of healthcare professionals in shaping parental attitudes toward vaccination.

III. STUDY DESIGN

The study was conducted among the parents of children up to 15 yrs of age over the period of three months from October 2024 to December 2024 at Primary Health Centre, Choornikkara, Aluva. This research utilise the cross-sectional observational survey with questionnaire responses gathered to best reflect the public knowledge. The questionnaire was prepared in such a way that all subjects could answer it with relative ease. It was validated by the research guide and experts from department of pharmacy practice. The questionnaire was distributed to 230 individuals out of which 200 responses were selected as per the inclusion and exclusion criteria.

IV. STUDY INSTRUMENT AND ADMINISTRATION

The study used a 16-item semi-structured questionnaire to assess parents' knowledge, perceptions, and attitudes toward childhood vaccinations. The first part collected demographic information, while the second part focused on vaccination-related topics. The questionnaire was adapted from a previous study based on a literature review. It was distributed in paper format by a team of five members at local PHCs, and participants were followed up by phone three days after vaccination to assess any mild reactions. Responses submitted after December 31, 2024, were excluded, and the data were analysed using advanced statistical methods.

Inclusion and Exclusion Criteria

Inclusion:

Parents of children who were willing to participate in study.

Parents who chose not to engage in study.

Exclusion:

All the answers should be duly filled in the questionnaire.

Incomplete questionnaire were also excluded.

V. RESULTS AND DISCUSSIONS

This observational study aimed to assess parental attitudes toward childhood vaccination through a cross-sectional survey. A semi-structured 16-item questionnaire was used to gather data on parents' knowledge, perceptions, and attitudes regarding vaccine safety, effectiveness, and importance. Data was collected from 230 parents, with 200 responses meeting the inclusion criteria. The study identified key factors influencing vaccination decisions, common misconceptions, and areas where improved education and communication are needed. The findings highlight the importance of parental perceptions in vaccine acceptance and suggest strategies to boost vaccine confidence in the community.

A total of 200 parents were selected as the sample size, representing a range of characteristics, such as the age and gender of their children, as outlined below.

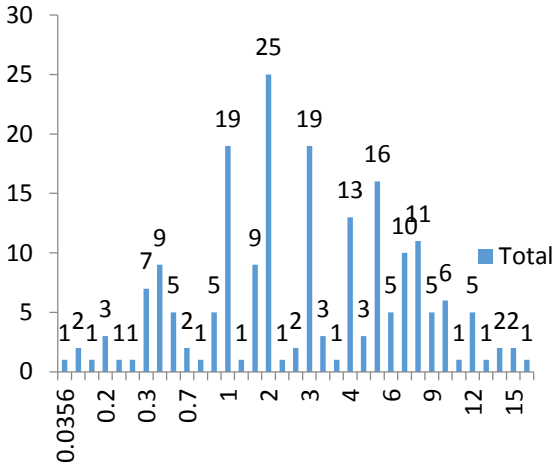

Fig 2: Age group of children under this study

Q: Are you familiar with the recommended childhood immunizations?

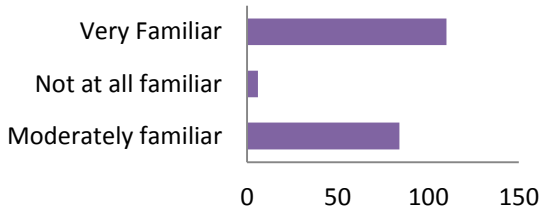

Fig 3: Familiarity with childhood immunization

The survey revealed varying levels of familiarity with childhood immunizations among parents. While 55.5% reported being "very familiar" with the recommended immunization schedule, 41.5% were "moderately familiar," and 3% were "not at all familiar." This indicates a positive level of awareness but also highlights the need for continued education, as nearly half of the respondents reported only moderate familiarity. Parents with higher education levels were more likely to be very familiar with vaccines. The Chi-Square test showed statistical significance (p-value of 0.0), suggesting a higher-than-expected awareness of immunizations among parents.

Q: Have you ever looked for information about vaccines?

Fig 4: Overview of Vaccine Search Behaviour

- 89% of participants actively sought vaccine information, while 7% did not, with 3% unsure and 1% unanswered.
- The high level of interest suggests safety and side effects were key concerns.
- Those who didn't seek information may trust current vaccination practices or feel no need to explore further, highlighting potential for targeted education.
- Chi-square test (p-value = 1.00) shows no significant difference between observed and expected data, indicating familiarity levels align with assumptions.

Q. Where did you look or who did you talk to about childhood vaccination?

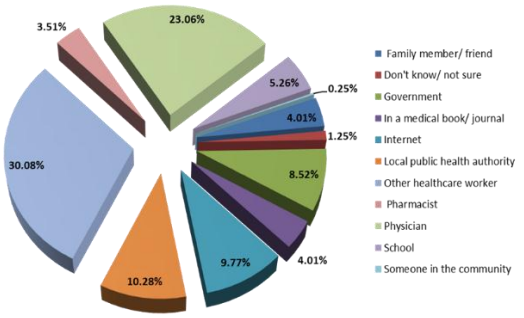

Fig 5: Sources of Information Regarding Childhood Vaccination

The survey responses revealed that participants used a range of sources to gather information about childhood vaccinations. The most frequently mentioned sources included:

• Physician: 23.06%

• Other healthcare workers: 30.08%

• Family member/friend: 4.01%

• Internet: 9.77%

• Local Public Health Authority: 10.28%

• Pharmacist: 3.51%

• Government: 8.52%

• School: 5.26%

• In a medical book/journal: 4.01%

• Someone in the community: 0.25%

• Don't know/Not sure: 1.25%

- The most trusted sources for childhood vaccination information are physicians, local public health authorities, the internet, government, and healthcare workers, emphasizing the role of professionals in providing reliable information.
- Family, friends, pharmacists, medical journals, and schools were also common sources.
- A small number of respondents were unsure where to find information, highlighting the need for clearer guidance.
- The results emphasize the importance of healthcare professionals, while also showing opportunities to improve the distribution of reliable information through public health authorities, schools, and online platforms. Efforts should guide people toward credible sources for well-informed vaccination decisions.

Q: Adequacy of Information and Resources for Informed Decision-Making?

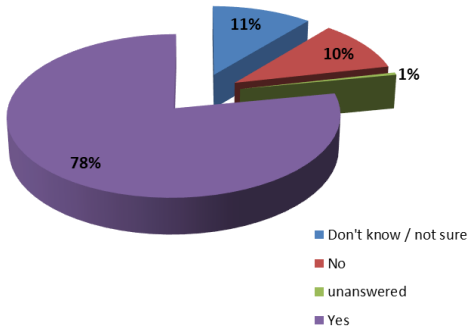

Fig 6: Adequacy of Vaccination Information for Parental Decision-Making

- 78% of participants felt confident in making informed vaccination decisions, while 10% did not, 11% were unsure, and 1% unanswered.
- Most respondents felt they had enough information, reflecting trust in healthcare providers and public health campaigns.
- However, 10% felt they lacked sufficient information, suggesting concerns about vaccine safety and effectiveness.
- 11% were unsure about their resources, highlighting a need for clearer guidance.
- Public health efforts should address these knowledge gaps with easy-to-understand, evidence-based information.
- Chi-square test (p-value = 0.995) shows no significant deviation from expected data.

Q. Have you ever had a conversation with a medical expert about giving immunizations to your child?

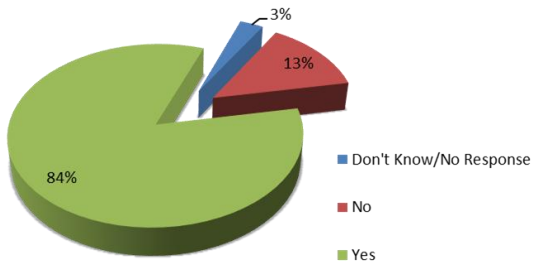

Fig 7: Conversations with Healthcare Professionals about Child Vaccinations

- 84% of respondents have spoken with a medical expert about immunizations, while 13% have not, and 3% were unsure or didn't respond.
- Most parents engage with healthcare professionals, such as physicians or pediatricians, about vaccinations, which is a positive trend.
- 13% of respondents have never had such a conversation, suggesting some caregivers may not fully utilize healthcare experts for vaccine-related questions.
- The 3% unsure or non-responding likely indicates uncertainty or reluctance to answer.

Q. My healthcare provider explains the risks and benefits of vaccines clearly.

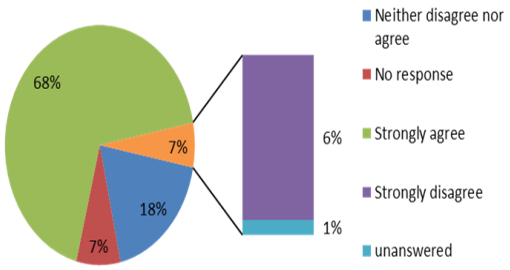

Fig 8: Clear Communication on Vaccine Risks and Benefits

- 68% of respondents strongly agreed that their healthcare provider clearly explains the risks and benefits of vaccines, while 18% were neutral, 6% disagreed, 7% did not respond, and 1% left it unanswered.
- The majority feel healthcare providers effectively educate families, but 18% were neutral, possibly indicating unclear or inconsistent communication.

- 6% strongly disagreed, suggesting some parents feel the risks and benefits aren't adequately communicated, which could lead to misunderstandings or vaccine hesitancy.
- The 7% "No Response" may reflect a lack of engagement or relevance to their situation.
- Chi-square test (p-value = 0.995) shows no significant difference from expected responses.

Q. To which of the following statements will you agree?

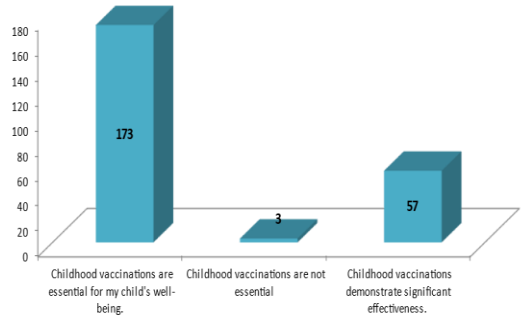

Fig 9: Perceptions on the Importance and Effectiveness of Childhood Vaccinations

- 86.5% of respondents agreed that childhood vaccinations are essential for their child's well-being, while 28.5% agreed they are significantly effective.
- The majority strongly support vaccinations for child protection from preventable diseases.
- 24% of respondents recognized the direct effectiveness of vaccinations in preventing illnesses.
- Only 2% disagreed with the importance of childhood vaccinations, suggesting a small group with doubts or opposing beliefs.

Q. How important do you think the following vaccines are preventing diseases in children?

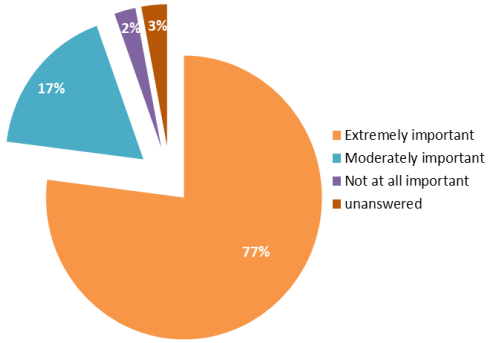

Fig 10: Perceived effectiveness of MMR vaccine in children

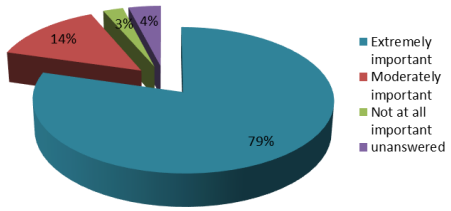

Fig 11: Perceived effectiveness of BCG vaccine in children

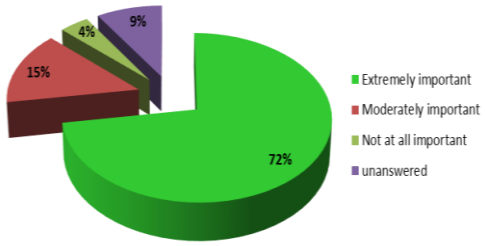

Fig 12: Perceived effectiveness of DTwP/DTaP vaccine in children

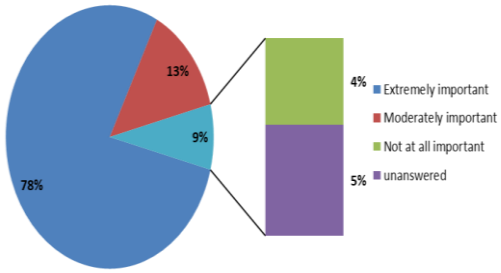

Fig 13: Perceived effectiveness of OPV in children

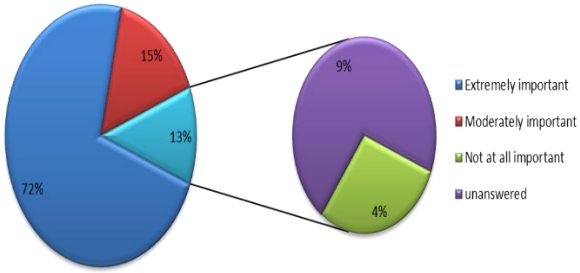

Fig 14: Perceived effectiveness of IPV in children

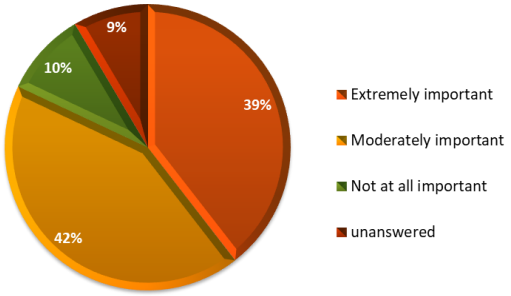

Fig 15: Perceived effectiveness of Chicken pox vaccine in children

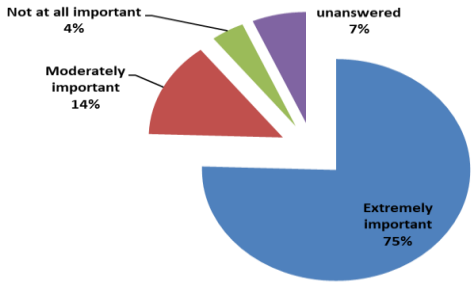

Fig 16: Perceived effectiveness of Hepatitis B vaccine in children

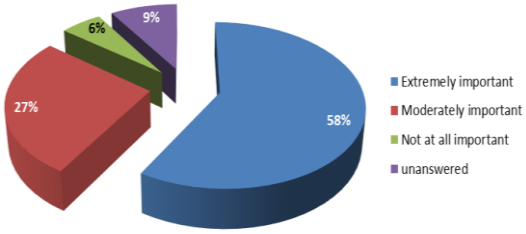

Fig 17: Perceived effectiveness of Hepatitis A vaccine in children

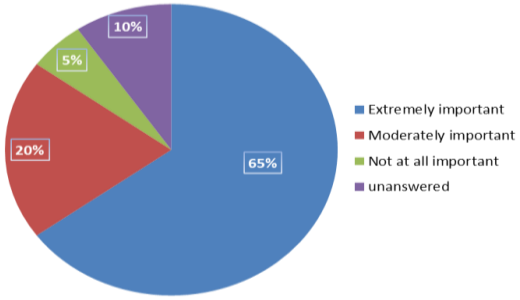

Fig 18: Perceived effectiveness of HPV vaccine in children

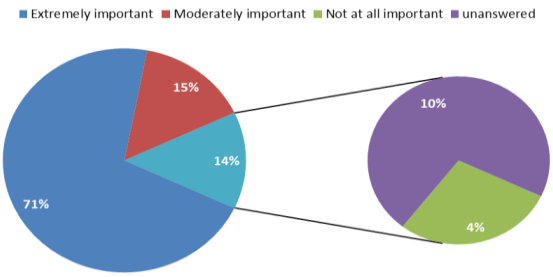

Fig 19: Perceived effectiveness of Rotavirus vaccine in children

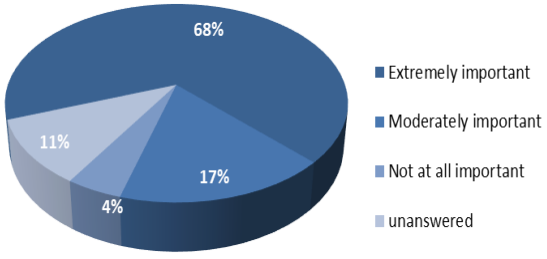

Fig 20: Perceived effectiveness of PCV in children

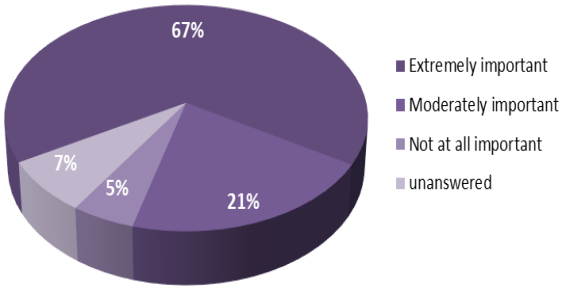

Fig 21: Perceived effectiveness of Influenza vaccine in children

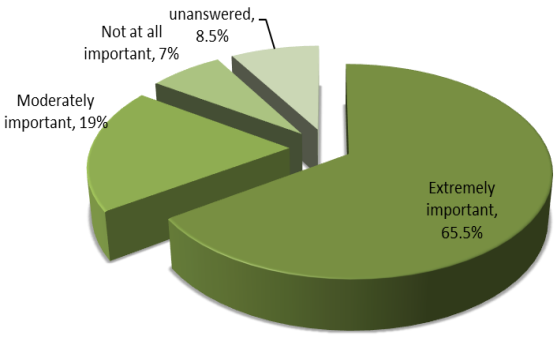

Fig 22: Perceived effectiveness of Typhoid vaccine in children

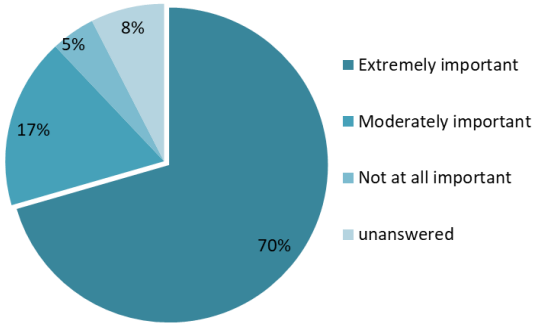

Fig 23: Perceived effectiveness of Vitamin A vaccine in children

Survey results show strong agreement on the importance of vaccines like BCG, MMR, DTaP, PCV, Hepatitis, Rotavirus, and polio for children's health. However, vaccines like Typhoid and Vitamin A supplementation were seen as moderately important, while HPV and Varicella raised some uncertainty. Public health campaigns can target regions or groups with differing vaccine perceptions to increase awareness, especially for vaccines viewed as less urgent.

Q. Has your child received all the vaccines that are recommended for children up to his/her age?

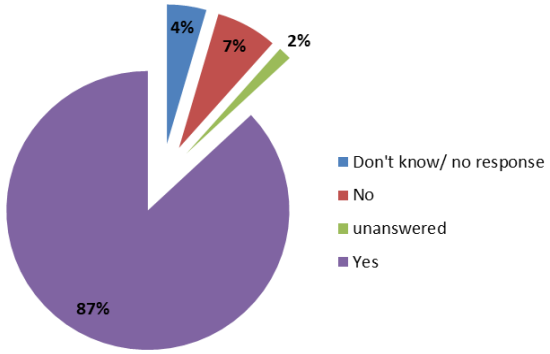

Fig 24: Vaccination Coverage for Children

- 87% of respondents reported that their child has received all recommended vaccines, 7% said their child hasn't, and 6% were unsure or didn't respond.
- The high percentage of vaccinated children suggests successful public health campaigns and parental adherence to vaccination guidelines.
- The 7% not vaccinated may face risks from preventable diseases due to vaccine hesitancy or logistical barriers. Addressing these issues through education and improved access could help reduce this group.
- The 6% unsure or non-respondents may lack awareness or engagement with healthcare providers. Providing better records and reminders could improve vaccination tracking.
- A p-value of 0.995 indicates no significant difference between observed and expected responses.

Q. Which vaccine or vaccines has your child received?

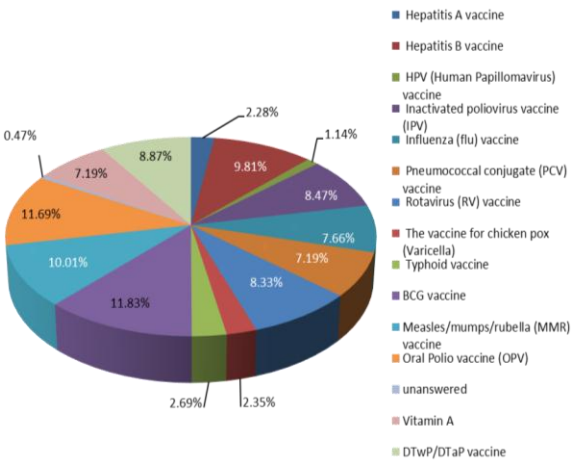

Fig 25: Child's Vaccination Profile

- The responses to this question were as follows, with the percentage of respondents who indicated that their child received each vaccine:
  - Measles/mumps/rubella (MMR) vaccine: 10.01%
  - BCG vaccine: 11.83%
  - DTwP/DTaP vaccine (Diphtheria, Tetanus, Pertussis): 8.87%
  - Oral Polio vaccine (OPV): 11.69%
  - Inactivated poliovirus vaccine (IPV):8.47%
  - The vaccine for chicken pox (Varicella):2.35%
  - Hepatitis B vaccine: 9.81%
  - Hepatitis A vaccine:2.28%
  - HPV (Human Papillomavirus) vaccine: 1.14%
  - Rotavirus (RV) vaccine: 8.33%
  - Pneumococcal conjugate (PCV) vaccine: 7.19%
  - Influenza (flu) vaccine: 7.66%
  - Typhoid vaccine: 2.69%
  - Vitamin A: 7.19%
  - Unanswered: 0.47%

- Core vaccines like MMR, DTaP, Hepatitis B, OPV, IPV, BCG, PCV, Rotavirus, Influenza, and Vitamin A have high uptake, indicating good adherence to standard immunization schedules.
- However, vaccines like Chickenpox (2.35%), Typhoid (2.69%), Hepatitis A (2.28%), and HPV (1.14%) have lower uptake, possibly due to vaccine hesitancy or misconceptions about their importance.
- Public health efforts should focus on increasing awareness, educating parents on the importance of these vaccines, and addressing vaccine hesitancy to improve overall vaccination rates.

Q. Has your child received all vaccinations at the recommended ages according to government guidelines?

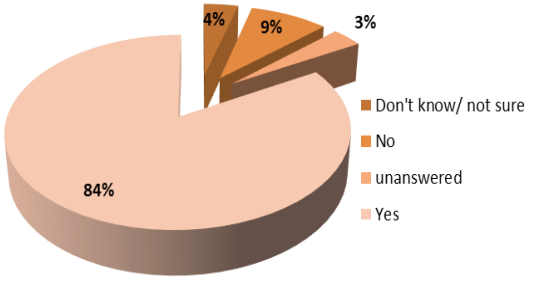

Fig 26: Child's Vaccination Compliance with Government Guidelines

- 84% of respondents reported their child received all vaccinations as per government guidelines, 9% did not, and 7% were unsure or did not respond.

- The majority of parents follow vaccination schedules, suggesting trust in healthcare and government recommendations.
- The 9% not vaccinated may face issues like accessibility or health concerns.
- The 7% unsure may lack awareness about their child's vaccination status.
- A p-value of 0.2159 shows no statistically significant difference between observed and expected responses.

Q. Since your child's vaccination, have you noticed any of the following adverse reactions?

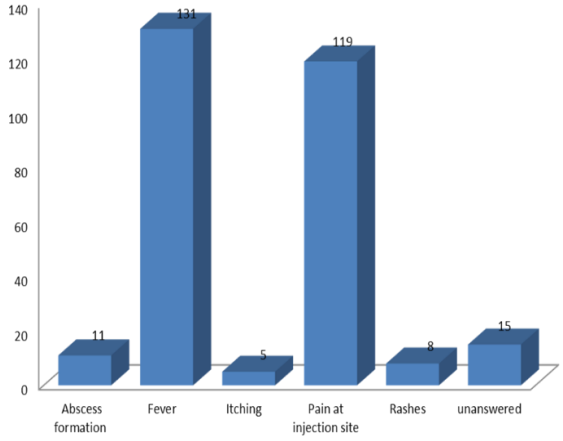

Fig 27: Post vaccination adverse effects in children

- Pain at the injection site was the most common reaction, reported by 41.18% of respondents, followed by fever (45.33%), both of which are mild and temporary side effects.
- Rashes (2.77%) and itching (1.73%) were less common, and abscess formation was reported by 3.81% of respondents, mainly with BCG and DTaP vaccines.
- These reactions align with expected mild side effects, and the low frequency of serious reactions suggests vaccines are generally safe.

Q. What are your biggest concerns about childhood vaccines?

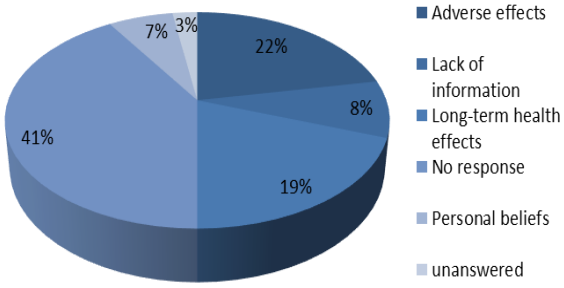

Fig 28: Parental Concerns Regarding Childhood Vaccines

- 22% of respondents were concerned about immediate vaccine side effects.
- 19% were worried about long-term health effects, likely due to misinformation, despite vaccines being proven safe.
- 8% expressed concerns about a lack of information, highlighting the need for clearer communication.
- 7% cited personal beliefs, including cultural or religious views, as reasons for concern.
- 3% didn't express any concern or didn't respond.
- A p-value of 0.6926 shows no statistically significant difference between observed and expected concerns.

Q. How much do you agree with the following statements?

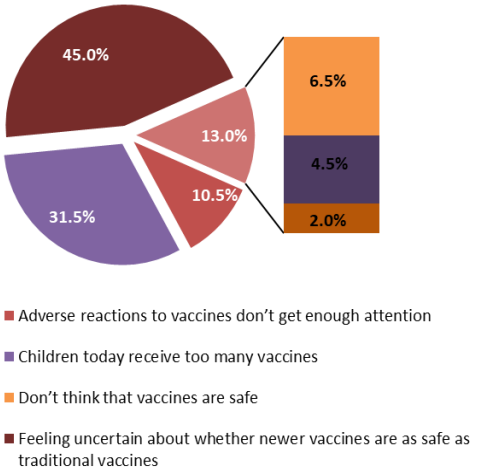

Fig 29: Opinions on Vaccine Safety, Reactions, and Alternatives

- 45% of respondents were concerned about the safety of newer vaccines compared to traditional ones, likely due to limited information.
- 10.5% felt that adverse reactions to vaccines aren't given enough attention, possibly based on personal experiences.
- 31.5% believed children today receive too many vaccines, a concern that may stem from misinformation.
- 6.5% disagreed with the statement that vaccines are unsafe, indicating most parents trust vaccine safety.
- 2% supported using alternative practices instead of vaccines, while 4.5% did not respond to the question.

Q. Has your child received HPV vaccine (daughter only)?

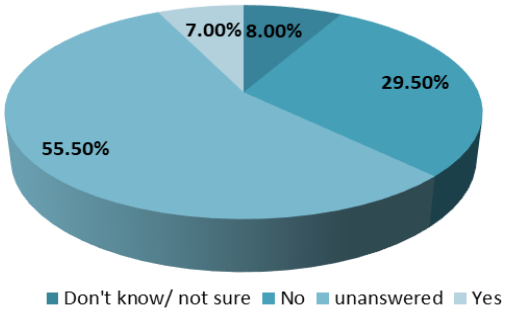

Fig 30: HPV Vaccination Status for Daughter

- 7% of respondents confirmed their daughter received the HPV vaccine, indicating some awareness of its importance in preventing HPV-related cancers.
- 29.5% reported their daughter has not received the vaccine, possibly due to gaps in awareness, access, or concerns.
- 8% were unsure, and 55.5% didn't respond, suggesting a need for clearer communication about the vaccine's importance and availability.
- A p-value of 0.749 indicates no statistically significant difference between observed and expected responses.

Q. Can you enumerate the principal factors that influenced your decision of having your daughter vaccinated against HPV?

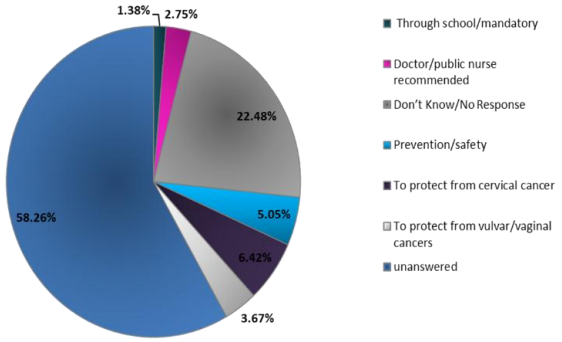

Fig 31: Factors Influencing the Decision to Vaccinate Daughter Against HPV

- 6.42% of respondents cited the HPV vaccine's role in preventing cervical cancer as the main reason for vaccination.
- 3.67% mentioned protection against vulvar and vaginal cancers, also linked to HPV.
- 5.05% chose "prevention/safety" as a key factor, viewing vaccination as a proactive health measure.
- 2.75% were influenced by healthcare provider recommendations.
- 1.38% were motivated by school mandates.
- 22.48% didn't answer or were unsure, indicating potential lack of understanding about the vaccine's benefits.
- 58.26% left the question unanswered, possibly due to having younger children or lack of awareness.

LIMITATIONS

• Limited Sample Size: The study only included 200 respondents, which may not be fully representative of the entire population of parents in the area.

• Geographical Limitation: The study was conducted exclusively at the Primary Health Centre in Choornikkara, Aluva, which may not represent the general knowledge or perceptions of parents in other regions.

• Self-Reported Data: The data collected was based on self-reports from the parents, which may be subject to bias.

• Exclusion of Late Responses: Responses submitted after December 31, 2024, were excluded from the study. This may result in the exclusion of potentially valuable data.

• Limited Duration of Data Collection: The study period of three months may not have captured long-term trends or shifts in attitudes and perceptions that could occur over a longer period.

SCOPE FOR FUTURE STUDIES

- Future studies could use a longitudinal design to track changes in parental knowledge over time and include a larger, more diverse sample for broader insights.
- Expanding the geographic scope and incorporating qualitative methods like interviews would deepen understanding of parental attitudes.
- Research could also explore the correlation between knowledge and vaccination uptake, evaluate the impact of educational interventions, and examine cultural and social factors influencing vaccination decisions.
- Additionally, studying knowledge retention and age-related differences in parental attitudes

would provide valuable insights for improving vaccination strategies.

- Inclusion of Healthcare Providers Perspectives on vaccination could offer valuable insights into how they perceive parental knowledge and how they address concerns.

CONCLUSION

This study surveyed 200 parents on their attitudes towards childhood vaccination. While many parents were familiar with standard vaccines, there were significant gaps in understanding certain vaccines and the immunization schedule. Most parents sought information from healthcare professionals, though some relied on informal sources. While support for immunization was high, vaccines like Typhoid and HPV had lower uptake due to concerns about side effects and long-term safety. The study highlights the need for targeted educational campaigns, particularly for vaccines like HPV, to improve awareness and confidence. Clear communication from healthcare providers and public health authorities is essential to correct misconceptions and encourage informed vaccination decisions.

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