

Strategies for the improvement of pediatric vaccination: an analysis based on the perception of parents and guardians

Estratégias para o aprimoramento da vacinação infantil: análise baseada na percepção de pais e responsáveis

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ABSTRACT | OBJECTIVE: To analyze strategies for improving childhood vaccination based on the perceptions of parents and/or guardians within the context of Primary Health Care. **METHODS:** This is a qualitative study conducted with 38 parents and/or caregivers of children up to two years old, carried out in five Family Health Units (*Unidades de Saúde da Família* – USF). Information obtained from focus groups was subjected to Thematic Content Analysis. The vaccine hesitancy framework supported the study, guiding the interpretation of participants' experiences and underpinning practical interventions. **RESULTS:** Two thematic categories emerged: communication strategies and service strategies and intersectoral practices. The importance of combining social media and traditional channels to expand campaign reach was highlighted, as well as the need for clear communication by professionals, the guiding role of the healthcare team, the usefulness of the Child's Health Handbook (*Caderneta da Criança*), and the effectiveness of intersectoral actions. **CONCLUSION:** Strategies for improving childhood vaccination focus on comprehensive restructuring of health communication, combining digital and traditional media to rebuild public trust, and reorienting services. The proactive role of the healthcare team, the use of the Child's Health Handbook as an important educational tool, and the strengthening of operational intersectoral actions to mitigate barriers related to vaccine hesitancy are emphasized.

KEYWORDS: Vaccination. Vaccine Hesitancy. Primary Health Care. Health Communication. Immunization.

RESUMO | OBJETIVO: Analisar estratégias para o aprimoramento da vacinação infantil a partir da percepção de pais e/ou responsáveis no âmbito da Atenção Primária à Saúde. **MÉTODOS:** Estudo de abordagem qualitativa desenvolvido com 38 pais e/ou responsáveis por crianças de até dois anos, realizado em cinco Unidades de Saúde da Família. As informações resultantes dos grupos focais passaram por Análise de Conteúdo Temática. O referencial da hesitação vacinal ancorou o estudo para nortear a interpretação das experiências dos participantes e embasar intervenções práticas. **RESULTADOS:** Emergiram duas categorias temáticas: estratégias de comunicação e estratégias do serviço e práticas intersectoriais. Evidenciou-se a importância do uso combinado de mídias sociais e canais tradicionais para ampliar o alcance das campanhas, a necessidade de comunicação clara pelos profissionais, o papel orientador da equipe, a utilidade da Caderneta da Criança e a eficácia de ações intersectoriais. **CONCLUSÃO:** As estratégias para o aprimoramento da vacinação infantil centram-se na reestruturação integral da comunicação em saúde, combinando mídias digitais e tradicionais para resgatar a confiança populacional, e na reorientação dos serviços. Destaca-se a atuação proativa da equipe, o uso da Caderneta da Criança como importante instrumento educativo, bem como o fortalecimento de ações intersectoriais operacionais mitigando barreiras da hesitação vacinal.

PALAVRAS-CHAVE: Vacinação. Hesitação Vacinal. Atenção Primária à Saúde. Comunicação em Saúde. Imunização.

1. Introduction

Immunization is one of the most cost-effective public health interventions, saving two to three million lives per year worldwide¹. In Brazil, the National Immunization Program (*Programa Nacional de Imunizações* – PNI) is considered one of the most comprehensive vaccination programs in the world, offering more than 15 vaccines free of charge and playing a crucial role in the reduction, control, and eradication of vaccine-preventable diseases and deaths².

Since the 1990s, vaccination rates among Brazilian children reached 95%, but from 2016 onwards, a decline of 10 to 20 percentage points has configured a worrisome scenario, coinciding with an increase in infant and maternal mortality³. This decline can be attributed to factors such as the weakening of the Unified Health System (*Sistema Único de Saúde* – SUS), the incorporation of new information systems on immunization, misinformation and fake news, and social and cultural influences on adherence to vaccination^{4,5}. In addition, with the COVID-19 pandemic, the World Health Organization (WHO) warned of a further decline in vaccination coverage rates⁶.

The lack of infrastructure and inequality in access to health services also represent significant barriers to achieving and maintaining adequate vaccination coverage rates in Brazil⁷. It is evident that a considerable number of health services do not have properly equipped or clearly identified vaccination rooms, which compromises the quality of care and contributes to missed opportunities for vaccination. These obstacles, combined with shortages of human resources and lack of ongoing training for health professionals, hinder the achievement of the vaccination targets established by the PNI⁷.

Another contributing factor to the reduction in vaccination coverage rates is vaccine hesitancy, a complex and multifactorial phenomenon that has become significant in several parts of the world³. The concept of “vaccine hesitancy” was developed in 2014 by the Vaccine Hesitancy Working Group of the Strategic Advisory Group of Experts (SAGE), linked to the World Health Organization^{8,9}. Hesitancy is understood as a delay in acceptance or refusal

of recommended vaccines, regardless of the availability of immunobiologicals in health services. It is a continuum of behavior, ranging from full acceptance to complete refusal, and is classically determined by the “3 Cs” model: confidence (in the effectiveness and safety of vaccines and in the health system), complacency (low perceived risk of vaccine-preventable diseases), and convenience (physical barriers, availability, accessibility, and understanding of services)^{8,9}.

The success of vaccination is directly linked to the broad acceptance of this measure by the population, and its effectiveness depends on continuous adherence, which is essential to maintain herd immunity and prevent the spread of the infectious agent¹⁰. Even with the scientific evidence proving the effectiveness and successes of mass immunization, social reactions against vaccines are as old as the very history of immunization, creating challenges for public health¹¹.

Scientific production has advanced in the understanding of vaccine hesitancy, especially in international, high-income contexts with health systems that differ from the Brazilian reality. However, little progress has been made in translating theoretical constructs into an operational plan, particularly when applied to the Brazilian reality under the aegis of a universal health system¹².

It is believed that this type of approach favors the proposition of a more sustainable operational plan for Brazilian Primary Care, by suggesting actions to face misinformation and strengthen trust, as well as collaborating in the implementation of public policies that ensure equitable access to immunization services and reduce logistical and socioeconomic barriers to vaccination^{13,14}.

In view of this scenario, the following research question arises: What are the main strategies, from the perspective of parents and guardians, for improving childhood vaccination within Primary Care? To answer this question, the objective of this study was to analyze strategies to improve childhood vaccination based on the perceptions of parents and/or guardians in the context of Primary Health Care (PHC).

2. Methods

This study was designed with a qualitative, exploratory-descriptive approach. The conduct of the research and the preparation of this report strictly followed the guidelines of the Consolidated Criteria for Reporting Qualitative Research (COREQ), an international framework that aims to ensure transparency and methodological quality in qualitative research. The analysis of the findings was supported by the theoretical construct of vaccine hesitancy from two perspectives: to guide the interpretation of the perceptions and experiences reported, and to provide scientific foundation for the proposed interventions.

Field activities, specifically data collection through focus groups, were carried out between July and November 2023.

For sample composition, precise eligibility criteria were established. Parents or legal guardians of children up to two years old (24 months), residing in the catchment area of the selected Family Health Units (*Unidades de Saúde da Família* – USF), were included in the study. The additional inclusion criteria were: minimum age of 18 years for the parent/guardian; living in the same household as the child; being registered at the respective USF for more than one year; and expressing agreement to voluntarily participate in the research.

The exclusion criterion was applied during the recruitment phase. Individuals who, after being randomly selected, could not be contacted by the research team after three attempts made on different days and at different times were excluded from the selection process and were not replaced.

The study was conducted in five USFs located in the municipality of Rondonópolis, Mato Grosso. To ensure diversity in participants' perceptions and to guarantee representativeness of the organization of the municipal health system, a stratified sampling process was adopted. One USF from each of the five existing health districts in the municipality was selected through simple random draw.

The target population consisted of parents and guardians who met the eligibility criteria. Participant selection was based on lists of families with children in

the age group of interest, provided by the five selected USF. In each unit, 12 participants were randomly drawn, resulting in an initial potential sample of 60 individuals. The number per unit considered what is recommended for conducting a Focus Group (FG), which is up to 15 people. The recruitment process began through previously scheduled home visits or telephone contact. On these occasions, the researchers presented the objectives and details of the project and scheduled the focus group meetings. On the day before the meetings, participants were reminded by telephone. Although all confirmed their presence, a total of 38 people attended the meetings. Among those present, there were no losses or dropouts.

The main technique for data collection was the focus group. This methodology was chosen for its ability to generate rich data from interaction and dialogue among participants. Discussion groups aim to explore a specific topic, providing opportunities for the exchange of experiences and the collective construction of meanings, which proved ideal for investigating shared perceptions about vaccination¹⁵. Data collection was preceded by a pilot test conducted with users with similar characteristics, but at a USF not included in the study. On this occasion, both the sociodemographic questionnaire and the script of open-ended questions for the focus group were refined. One of the adjustments was the inclusion of hypothetical situations about vaccine hesitancy involving children, a strategy that proved effective in making the discussion more dynamic and deepening issues embedded in the instrument.

In total, five focus group meetings were held, one in each selected USF. The sessions were composed exclusively of the researchers and the invited parents/guardians and included approximately seven to eight participants per meeting. They were held on the premises of the health units themselves or in community spaces located in the catchment areas. Each meeting began with the reading and signing of the Informed Consent Form. Next, a questionnaire was applied to collect sociodemographic and economic data, in order to characterize both the child and the family unit.

The group discussions, which lasted an average of one hour, were led by the project coordinators. The two researchers had training in nursing and doctoral degrees in public health, one of them

with experience in coordinating groups applied to health research. The interviewers had no ties to the service or to the participants and shared the roles of moderator and observer; the latter was responsible for recording, on a specific form, behaviors and nonverbal expressions displayed by participants during the FG. The dialogue was guided by a script with open-ended questions. All sessions were audio-recorded and later transcribed verbatim, faithfully and completely. After this process, the interviews did not return to participants for comments or additions.

Data analysis followed a mixed approach. Quantitative information from the sociodemographic questionnaire was organized into spreadsheets in Microsoft Excel and subjected to descriptive statistical analysis, being presented as absolute and relative frequencies.

Qualitative data from the focus group transcripts were analyzed using the Thematic Content Analysis technique¹⁶. In this perspective, the analytical and coding process was carried out by two researchers and involved exhaustive reading of the empirical material, followed by exploration and interpretation of statements aligned with the study objectives, seeking to identify meaning-making in the reports of parents and guardians until information power and data saturation were reached, the latter being determined at the point when the data began to reproduce information already collected. To ensure anonymity, participants were coded with the letter "P", followed by a sequential number from P1 to P38.

From the systematization of the data, two central thematic categories emerged that structured the presentation of the results: 1) Communication approaches and health service strategies; and 2) Intersectoral practices. The textual content of these categories was analyzed in the light of the theoretical concept of vaccine hesitancy.

All ethical procedures were observed, and the project was submitted to and approved by the Research Ethics Committee of the Federal University of Rondonópolis (Universidade Federal de Rondonópolis), in accordance with the norms established by Resolution No. 466/2012 of the National Health Council, CAAE 58784422.4.0000.0126, approval number 5.442.375/2022.

3. Results

The 38 parents/guardians who participated in the study were female, most of them mothers (89.5%), and 10.5% were grandmothers of the selected children; 86.8% self-identified as non-White, 60.5% were between 18 and 28 years of age, and 60.2% had completed high school. Among the children, the majority were male (52.6%), non-White (86.8%), and most (42.1%) were between 13 and 25 months of age. In the households, the most prevalent income bracket was up to R\$ 2,000.00 (60.0%), and 57.9% received benefits from the Bolsa Família Program.

From the information collected in the FGs, the discourses were analyzed in the light of the theoretical framework of vaccine hesitancy, seeking to identify how the dimensions of confidence, complacency, and convenience permeated the barriers and solutions pointed out by participants. The synthesis of this analysis resulted in the systematization of the main strategies to improve childhood vaccination within PHC into two categories: communication strategies (measures mainly aimed at strengthening institutional trust and combating complacency) and service strategies and intersectoral practices (focused on expanding convenience and overcoming practical barriers to access). Each of these categories details the perceptions and suggestions of users, in their role as parents/guardians, reflecting their experiences and pointing to specific measures within the health system to mitigate vaccine hesitancy.

3.1 Communication strategies

The use of social networks as a means of publicizing vaccination campaigns emerged as an important strategy, given that they are currently one of the main sources of information:

"I honestly think that Instagram, Facebook, WhatsApp... because, whether you like it or not, people see social media much more than TV. So it's easier to call people, right, to vaccinate" (P1).

The combination of digital and traditional media was identified as a way to expand the reach of vaccination campaigns, reaching different audiences. There is a valuing of traditional television campaigns, especially those that use characters and important social actors recognized throughout history:

"In the past there was Zé Gotinha, there were lots of campaigns launched on TV, right, there was Zé Gotinha, I think in the past there was, those who watch the news, soap operas, would see that focus" (P2).

Providing clear and detailed information about the benefits and safety of vaccines, especially from institutional sources, was an essential strategy to reduce hesitancy and increase confidence in vaccination. Participants pointed out the scarcity of dissemination of specific data on the COVID-19 vaccine for children as a negative factor for vaccination:

"There could be more information, because no one came to me to explain why the COVID vaccine is important for children, no one ever told me" (P3).

"More information, I think that if the people who work in health would push the population more, right" (P4).

Expanding the use of communication tools by health professionals, such as social networks and WhatsApp, optimizes the time of health workers, broadens users' access to information about vaccines, and favors timely vaccination, in addition to preventing unnecessary trips:

"If the community health worker has your WhatsApp number, she sends messages too. And she warns: 'This vaccine is missing for the mother as well.' And also, especially... with babies, we ask things on WhatsApp and she answers too, 'Is this vaccine available? Can I take my baby?' 'Yes, you can bring her, we have it,' or 'No, it'll arrive on such a day,' so we don't make a wasted trip, right" (P5).

3.2 Service strategies and intersectoral practices

Regarding the role of the PHC health team in vaccinating children, ensuring comprehensive and continuous care, articulated with other levels of care within SUS, is an essential aspect, as recommended by the health system guidelines:

"The pediatrician already tells you, when the baby is born, already gives you guidance: 'Look, go to the health center to vaccinate. The vaccines work like this and that'" (P6).

"I think the doctor too, when I brought her here, he was very firm: 'Look, do not miss the date under any circumstance.' We were going to travel to another state and he said, 'When the vaccine date comes, SUS is

national, you go to another clinic in the other state and vaccinate, do not miss the date'" (P7).

The Child's Health Booklet was highlighted as an important instrument for monitoring immunizations, regarded as an educational tool and a means of empowering families regarding their health care:

"Actually, one thing that has really changed is that booklet... the vaccination booklet, that little booklet... It is already very explanatory" (P8).

"So, if you read [the vaccination booklet], you will not miss it. And that guidance only adds to it" (P9).

Intersectoral coordination between schools and health services was pointed out as a fundamental strategy for expanding access to health and creating opportunities to keep the schedule up to date, as in the following excerpts:

"It has influence, whether we like it or not, because at enrollment they ask for it, they stay on top of it, so it does influence, yes" (P10).

"I think that in schools you could get more of the parents' attention, right, go into the school and send a note, and the teacher could hold a meeting there, you know" (P11).

Extending opening hours and days of service was proposed as a strategy to improve access for parents and guardians who work during regular business hours:

"I think the hours are bad, right, for those who work from 7:30 a.m. to 4:30 p.m. it's complicated, [...] vaccination on Saturdays or at a time after working hours" (P12).

The follow-up carried out by family health teams, especially by community health workers during home visits, was recognized and valued by participants:

"I think more visits too, for example, the community health worker always asks and goes to our home; if all neighborhoods were like ours, it would certainly improve" (P13).

"Yes, she always lets me know whenever there will be a central vaccination event outside normal days, she always lets me know; she doesn't go to my house, but she's always around" (P14).

4. Discussion

Given the knowledge produced and the absence of fathers in the development of this study, it is important to discuss the relevance of involving fathers in childcare and, consequently, the potential for bias. Understanding the roles played by men in fatherhood can guide more effective actions by nurses and/or health professionals in the context of primary care, such as encouraging participation in prenatal and childcare visits, which favors dialogue and awareness among men about the importance of childhood vaccination¹⁷.

It should be noted that this issue reflects and reinforces gender norms that have historically assigned childcare to women, and, in light of this, methodological strategies need to be devised to foster fathers' involvement in studies on child health and thus understand their perceptions regarding health care actions. Moreover, the benefits of active and responsible fatherhood are numerous, both for physical and emotional health, in view of maternal and child demands within the family context¹⁷.

Another aspect that requires greater attention is the importance of health communication as a bilateral process in which patients and the community provide continuous feedback, establishing trust in health institutions and improving service quality¹⁸. Social networks are an important source for seeking health information, given the ease of immediate access, including content on vaccines. However, despite the potential of these sources, they constitute an unregulated territory, which opens space for the dissemination of false news that feeds infodemic processes and hampers community access to reliable sources¹⁹.

Diversifying communication channels is fundamental to ensuring that vaccination campaigns are broader, more effective, and more inclusive¹⁰. While television provides wide reach, especially among older adults and communities with limited internet access, social networks are emerging as dynamic possibilities for engaging young people and connected audiences, enabling interaction, dissemination of multimedia content, and responses to frequently asked questions.

However, the effectiveness of these channels depends directly on the messages conveyed. The creation of educational campaigns that explain the process of vaccine development and approval, highlighting transparency and scientific rigor, has proven essential to address distrust^{18,20}. Official communication channels have the potential to provide complete and high-quality information; however, because they tend to adopt a more informative than explanatory bias, they often play a limited role in the community's health education process²¹.

While recognizing the importance of communication and strategies to address vaccine hesitancy, it is necessary to emphasize that this phenomenon cannot be reduced to a lack of information, as it is a multifactorial and complex process. Factors related to bioethics, such as autonomy and politics, substantially influence the act of vaccinating; thus, this decision should be co-produced with the population, considering specificities of each person, context, personal history, active listening, among other issues that are largely determined by trust¹².

The importance of transparency became especially evident in the context of the COVID-19 pandemic when authors identified distrust of official channels, such as health and governmental authorities, as a barrier to vaccination, particularly due to the lack of transparency in disseminating information on vaccine production and approval processes^{18,22}. In contrast to this mistrust in institutions, vaccination recommendations given by health professionals are a strong facilitator of immunization²¹. The trust placed in these professionals, especially when they explain vaccines in detail from the child's birth, reinforces adherence to immunization campaigns and combats denialist beliefs and misinformation²³.

In addition to professional performance, the Child's Health Booklet, implemented in Brazil in 1984, is an essential strategy for monitoring immunizations according to the vaccination schedule. Besides serving as an epidemiological tool and enabling analysis of vaccination coverage, it helps parents and guardians to monitor the vaccines planned for their children. The booklet presupposes the development of family autonomy, dedicating a section of the document solely to guidance for parents/guardians, thereby serving as a health education instrument²⁴.

Expanding the perspective beyond the relationship between professional and patient, the integration of sectors such as health, education, and communication has proved to be an effective strategy for increasing vaccination coverage. Collaboration between schools and health units, through vaccination campaigns carried out directly in school settings, has the potential to increase adherence to vaccines. The active involvement of teachers and the promotion of discussions on the importance of immunization are fundamental to reducing hesitancy and strengthening parents' trust in vaccination campaigns¹³.

However, for such integrated strategies to be fully effective, structural barriers must be overcome. Disparities in access to health services, especially vaccination, remain a persistent problem. The distance to USFs compromises equity in access to vaccines. Implementation of public policies that prioritize the equitable distribution of resources and health services is recommended in order to ensure that all communities, regardless of their geographic location or socioeconomic conditions, have facilitated access to vaccines¹⁴.

To mitigate challenges such as geographic distance, community health workers (*Agentes Comunitários de Saúde* – ACS) play a crucial role in the Family Health Strategy, conducting home visits to monitor family health, register and update information, promote health, and prevent diseases through educational activities²⁵. Home visits are a strategic tool for strengthening bonds between users and PHC. This approach not only improves satisfaction with services and in-person care but also promotes greater adherence to activities and treatments²⁶.

Indeed, studies have shown that the contact established by ACS between users and services can promote trust and ensure adherence to the vaccination schedule, which is associated with positive health outcomes, including increased vaccine uptake²⁵⁻²⁷. This continuous follow-up places ACS in a strategic position, exerting considerable influence on the population's intention to vaccinate and on strengthening childhood immunization.

This variety of successful approaches points to an important conclusion. A study that sought to analyze interventions to improve adherence to the COVID-19 vaccine showed that multicomponent

approaches had significant positive effects on vaccine acceptance. A multicomponent approach is defined as one that employs two or more combined strategies²⁸. As vaccine hesitancy is a multifactorial phenomenon, it requires a combination of strategies that also consider the perception of the population involved, using clear, accessible, and high-quality language.

A limitation of the study is that it was conducted in a single municipality, which may restrict the generalization of results to other geographic and socioeconomic contexts. The regional diversity of Brazil, with its cultural, socioeconomic, and organizational particularities in health services, suggests the need for multicenter studies to achieve a broader understanding of the phenomenon of vaccine hesitancy. Additionally, although the qualitative nature of the study allows for an in-depth understanding of participants' perceptions, it does not permit statistical generalization. Future quantitative research could complement these findings by measuring the effectiveness of the strategies identified in different populations and contexts. Finally, as previously discussed, the potential bias arising from the absence of fathers in the research is an important factor to be considered and requires the formulation of new strategies to encourage their participation in future studies.

5. Conclusion

By analyzing the perceptions of parents and guardians, this study identified that improving childhood vaccination in Primary Health Care requires a set of integrated strategies. First, communication strategies emerged, including the combined use of digital and traditional media to expand the reach of campaigns and the need for clear, proactive, and transparent communication by health professionals to strengthen trust.

Second, service strategies and intersectoral practices were highlighted, encompassing the valuing of the Child's Health Booklet (*Caderneta da Criança*) as a tool for family empowerment, coordination with schools to increase vaccination opportunities, and reorganization of services, such as flexible schedules and strengthening the role of community health workers, to ensure equitable access.

The results indicate that, to address vaccine hesitancy and restore and/or maintain high coverage, strategies must be developed that consider the perspective of parents/guardians, in line with the objective achieved in this study. It is concluded that understanding the views of those involved in making vaccination effective in the daily routine of health services, in this case, parents/guardians of children, provided input for those responsible for planning and managing vaccination actions, in the light of a relevant framework on vaccine hesitancy.

As a contribution to immunization practices aimed at restoring and maintaining high childhood vaccination coverage in the country, the study reinforces that tackling vaccine hesitancy requires integrated, sustainable, and adaptable approaches to different Primary Care contexts. The strategies involve modernizing health communication (aligning digital and traditional media), creating and strengthening partnerships in the territory, and investing in continuing education for teams, especially for nurses and community health workers.

Author's contributions

The authors declare that they made substantial contributions to the work in terms of the conception or design of the research; the acquisition, analysis, or interpretation of data for the work; and the drafting or critical revision of the manuscript for important intellectual content. All authors approved the final version to be published and agreed to be accountable for all aspects of the study.

Competing interests

No financial, legal, or political conflicts of interest involving third parties (government, companies, private foundations, etc.) were declared for any aspect of the submitted work (including, but not limited to, grants and funding, participation on advisory boards, study design, manuscript preparation, statistical analysis, etc.).

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