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Exploring Parental Acceptance and Hesitancy towards Childhood Covid-19 Vaccination: Evidence from Malaysia's National PICKids Programme

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ABSTRACT – Childhood vaccination has become one of the most debated public health interventions during the COVID-19 pandemic, particularly following the introduction of vaccines for younger children. In Malaysia, the National COVID-19 Immunisation Programme for Children (PICKids) was implemented to protect children aged 5–11 years against COVID-19. Despite extensive public health campaigns, parental acceptance of childhood vaccination remained inconsistent due to concerns regarding vaccine safety, effectiveness, and potential adverse effects. This study aimed to explore parents' perspectives towards the PICKids programme and identify the factors influencing their decisions to accept or reject COVID-19 vaccination for their children. A qualitative research design was employed using an online open-ended questionnaire administered through Google Forms. Purposive sampling was adopted to recruit parents of children aged between 5 and 11 years throughout Malaysia. Eighty-three parents participated in the study. The qualitative responses were analysed using Braun and Clarke's six-phase thematic analysis framework to identify recurring patterns and themes. The findings revealed that 71.1% of respondents supported the PICKids programme, whereas 28.9% expressed vaccine hesitancy or refusal. Three overarching themes emerged from the analysis: (i) trust in the vaccine and healthcare system, (ii) concerns regarding vaccine side effects, and (iii) parental responsibility in protecting children's health. Parents who accepted vaccination demonstrated confidence in scientific evidence, healthcare professionals, and previous immunisation experiences. In contrast, vaccine-hesitant parents reported uncertainty regarding vaccine safety, concerns about adverse effects, and greater reliance on information obtained through social media and personal networks. The study highlights that parental decision-making extends beyond medical considerations and is influenced by trust, perceived risk, social influence, and individual responsibility. These findings contribute to the growing body of literature on childhood vaccine acceptance by providing qualitative evidence from the Malaysian context. The study further suggests that transparent communication, evidence-based public health messaging, and sustained engagement by healthcare

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professionals are essential strategies for strengthening parental confidence in future childhood immunisation programmes.

INTRODUCTION

Childhood immunisation remains one of the most effective public health interventions for preventing infectious diseases and reducing childhood morbidity and mortality worldwide. Vaccination not only protects individual children against vaccine-preventable diseases but also contributes to community immunity by limiting disease transmission within the population. Consequently, ensuring high vaccination coverage among children has become a global public health priority, particularly during infectious disease outbreaks. The World Health Organization (WHO, 2015) recognises childhood immunisation as a fundamental strategy for reducing preventable deaths, improving child survival, and strengthening health systems through universal access to safe and effective vaccines.

The unprecedented COVID-19 pandemic has further reinforced the importance of vaccination as a primary public health intervention. Since the emergence of SARS-CoV-2, governments worldwide have implemented large-scale vaccination programmes to minimise severe illness, reduce mortality, and restore social and economic stability. In Malaysia, the Ministry of Health (MOH) introduced the National COVID-19 Immunisation Programme for Children (PICKids) to extend vaccine protection to children aged between five and eleven years. The programme administers the Pfizer-BioNTech Comirnaty® 10 mcg vaccine, an mRNA vaccine formulated specifically for children at one-third of the adult dosage (MOH, 2022). Clinical evidence has demonstrated that this vaccine provides up to 90.7% efficacy in enhancing immune protection against COVID-19 among children (WHO, 2022).

The implementation of the PICKids programme received encouraging public participation during its initial phase. Since its official launch on 1 February 2022, more than one million children had been registered by their parents or guardians within the first three weeks, representing approximately 28% of Malaysia's estimated population of 3.6 million children aged five to eleven years (Bernama, 2022). Similarly, Li-Ping Wong et al. (2022) reported that 43% of Malaysian children within this age group had received COVID-19 vaccination. These statistics indicate a generally positive response towards childhood vaccination while simultaneously highlighting that a considerable proportion of eligible children remained unvaccinated.

Although COVID-19 vaccination has been widely recognised as an important preventive strategy, parental decision-making regarding childhood vaccination remains highly complex. Throughout the pandemic, many parents complied with public health recommendations by receiving COVID-19 vaccines themselves, adhering to standard operating procedures (SOPs), and adopting preventive health practices. Such experiences have generally contributed to favourable attitudes towards vaccination. Marzo et al. (2023) reported that Malaysia recorded one of the highest levels of COVID-19 vaccine acceptance among adults (94.3%), while approximately 67% of parents expressed willingness to vaccinate their children. Nevertheless, high adult vaccine acceptance does not necessarily translate into universal acceptance of childhood vaccination, as parents often apply different considerations when making health decisions on behalf of their children.

The introduction of the PICKids programme also generated substantial public debate. Following the government's announcement, discussions regarding childhood COVID-19 vaccination became widespread across news media and social networking platforms, where parents openly expressed both support and concerns about vaccinating their children (Awani, 2022). While many parents perceived vaccination as an effective measure to protect their children against severe COVID-19 infection, others remained uncertain due to concerns regarding vaccine safety, possible adverse effects, and the relatively recent development of COVID-19 vaccines. Such differing viewpoints illustrate that parental acceptance of childhood vaccination is influenced by multiple factors extending beyond scientific evidence alone.

Despite increasing evidence regarding COVID-19 vaccine acceptance in Malaysia, much of the existing research has predominantly employed quantitative approaches to measure vaccination intention and associated determinants. Comparatively fewer studies have explored parents' own narratives and lived experiences that explain how they interpret available information, assess potential risks, and ultimately decide

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whether to accept or reject the PICKids programme. A deeper qualitative understanding of parental perspectives is therefore essential to complement existing quantitative findings and provide richer insights into the decision-making process surrounding childhood COVID-19 vaccination.

Accordingly, this study seeks to explore parents' perspectives regarding the implementation of Malaysia's National COVID-19 Immunisation Programme for Children (PICKids). Specifically, the study aims to (i) examine parents' decisions to accept or reject the PICKids vaccination programme, (ii) explore parents' views towards childhood COVID-19 vaccination, and (iii) identify the factors influencing parental acceptance and hesitancy towards the PICKids programme. The findings are expected to contribute to a better understanding of parental decision-making and provide evidence that may support the development of more effective public health communication strategies for future childhood immunisation programmes.

LITERATURE REVIEW

Childhood Immunisation as a Public Health Strategy

Childhood immunisation has long been recognised as one of the most successful public health interventions for preventing infectious diseases and improving child survival. In Malaysia, routine childhood vaccination has been implemented through the National Childhood Immunisation Programme since the early 1950s, contributing substantially to the reduction of vaccine-preventable diseases among children (Awis Qarny Othman et al., 2022). Through this programme, children receive vaccinations free of charge from the Ministry of Health (MOH), protecting them against serious infectious diseases such as poliomyelitis, diphtheria, pertussis, tetanus, tuberculosis, hepatitis B, and measles (Awis Qarny Othman et al., 2019).

The effectiveness of childhood immunisation extends beyond individual protection by contributing to herd immunity, thereby reducing disease transmission within communities. Li et al. (2021) estimated that vaccination programmes implemented across 98 countries significantly reduced mortality associated with ten major infectious diseases. Their modelling study projected that children born in 2019 would experience a 72% lower lifetime mortality risk from vaccine-preventable diseases compared to unvaccinated populations. Furthermore, without routine immunisation, mortality among children under five years of age would have been approximately 45% higher than currently observed. These findings reinforce the substantial contribution of vaccination programmes to global child health.

Similarly, vaccination has consistently demonstrated remarkable success in reducing the incidence of infectious diseases worldwide. According to Drutz (2023), routine childhood immunisation programmes implemented in the United States have reduced the occurrence of most vaccine-preventable diseases by more than 90%. Comparable achievements have also been observed in Malaysia, where immunisation initiatives and improvements in healthcare services contributed to an approximately 85% reduction in infant mortality between 1970 and 2017 (The Star Online, 2019). These outcomes illustrate that vaccination not only protects vaccinated individuals but also strengthens population-level health through community immunity.

Childhood COVID-19 Vaccination and the Emergence of the PICKids Programme

The emergence of the COVID-19 pandemic introduced unprecedented challenges to global public health systems and accelerated the development of novel vaccines. Following successful adult vaccination programmes, Malaysia expanded its national vaccination strategy by introducing the National COVID-19 Immunisation Programme for Children (PICKids) in February 2022 for children aged five to eleven years. The programme utilised the Pfizer-BioNTech Comirnaty® vaccine specifically formulated for children, with parents required to register their children through the MySejahtera application before attending designated vaccination centres.

Despite strong governmental commitment, the introduction of the PICKids programme generated considerable public discussion. News reports indicated varying parental reactions, ranging from strong support to considerable scepticism regarding childhood COVID-19 vaccination (Awani, 2022; Utusan, 2022; Sinar Harian, 2022). While some parents welcomed vaccination as an important preventive

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measure, others questioned vaccine safety and expressed concerns based on personal experiences following adult vaccination (Marzo et al., 2023). Similar controversies have also been reported internationally, indicating that parental concerns regarding childhood COVID-19 vaccination represent a global rather than a local phenomenon (Ledford, 2021). Consequently, vaccine hesitancy has emerged as an important public health challenge requiring greater understanding of parents' decision-making processes (Newman et al., 2022).

Theoretical Perspectives on Parental Vaccine Decision-Making

Understanding parental decisions regarding childhood vaccination requires an examination of established behavioural theories that explain health-related decision-making. One of the most widely applied frameworks is the Health Belief Model (HBM), which proposes that health behaviour is influenced by individuals' perceptions of disease susceptibility, disease severity, expected benefits, perceived barriers, cues to action, and self-efficacy (Rosenstock, 1974; Janz & Becker, 1984). Within the context of childhood vaccination, parents evaluate the perceived risk of COVID-19 infection alongside concerns regarding vaccine safety before deciding whether vaccination offers greater benefits than potential risks.

Complementing the HBM, the Theory of Planned Behaviour (TPB) suggests that behavioural intention is influenced by three principal components: attitudes towards the behaviour, subjective norms, and perceived behavioural control (Ajzen, 1991). Applied to childhood vaccination, parental decisions are shaped not only by their personal beliefs regarding vaccine effectiveness but also by social expectations, recommendations from healthcare professionals, and confidence in their ability to make informed decisions. Previous research has demonstrated the relevance of both theoretical models in explaining parental vaccine acceptance across different cultural settings (Pot et al., 2017; Limbu et al., 2022).

Factors Influencing Parental Acceptance and Vaccine Hesitancy

The literature consistently demonstrates that parental acceptance of childhood vaccination is influenced by multiple interacting factors rather than a single determinant. Parents who support childhood COVID-19 vaccination commonly identify child protection, family safety, and confidence in vaccine effectiveness as primary motivations (Diana Leh Ching Ng et al., 2022). Conversely, parents who reject vaccination frequently report uncertainty regarding newly developed vaccines, concerns about vaccine ingredients, insufficient information from healthcare providers, and fears regarding possible adverse effects (Diana Leh Ching Ng et al., 2022). Similar findings were reported by Rumetta et al. (2020), who identified perceived side effects, doubts about vaccine necessity, and inadequate knowledge as major contributors to vaccine refusal.

Socioeconomic characteristics have also been associated with parental vaccine hesitancy. Marzo et al. (2023) reported that lower household income, rural residence, full-time employment, possession of child health insurance, and the absence of chronic illness among children were associated with increased hesitancy towards the PICKids programme. These findings suggest that parental decision-making is influenced by both demographic characteristics and individual perceptions regarding disease risk and vaccine necessity.

From a broader perspective, vaccine hesitancy has been conceptualised as a multidimensional phenomenon. Dubé et al. (2013) proposed that vaccine acceptance is shaped by contextual influences, individual beliefs, and vaccine-specific characteristics. Building upon this framework, MacDonald (2015) introduced the "3Cs" model, comprising Confidence, Complacency, and Convenience as key determinants of vaccine hesitancy. Subsequently, Betsch et al. (2018) expanded this framework into the "5Cs" model by incorporating Calculation and Collective Responsibility, highlighting that parental vaccination decisions involve both rational risk assessment and broader social responsibility.

Religious Perspectives on Childhood Vaccination

In the Malaysian context, religious values also contribute to parental decision-making concerning childhood vaccination. The Federal Territory Mufti (2019) emphasised that childhood vaccination is permissible and encouraged under Islamic principles when it contributes to the protection of human life.

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This position is consistent with the principles of Maqasid al-Shariah, which prioritise the preservation of life as one of the fundamental objectives of Islamic law. Mohd Hazwan and Jasni (2022) further explained that the application of *Qawa'id Fiqhiyyah* provides an Islamic legal framework for addressing contemporary public health issues, including vaccination, through principles derived from the Qur'an, Sunnah, Ijma', and Qiyas. Consequently, childhood vaccination may be viewed not only as a medical intervention but also as a moral and religious responsibility aimed at safeguarding individual and community well-being.

Research Gap

Although previous studies have extensively examined parental acceptance and hesitancy towards childhood COVID-19 vaccination, existing evidence has primarily focused on measuring prevalence, demographic predictors, and statistical associations. Comparatively fewer studies have explored parents' lived experiences and underlying reasoning that shape their decisions to either accept or reject the PICKids programme through qualitative inquiry. Given that vaccination decisions are influenced by trust, perceived risk, family influence, personal experiences, and cultural values, a qualitative exploration is essential to generate a more comprehensive understanding of parental perspectives. Therefore, the present study addresses this gap by exploring parents' views and identifying the factors underlying parental acceptance and hesitancy towards Malaysia's National COVID-19 Immunisation Programme for Children (PICKids).

METHODOLOGY

Research Design

This study employed a qualitative research design to explore parents' perspectives regarding the National COVID-19 Immunisation Programme for Children (PICKids) in Malaysia. A qualitative approach was considered the most appropriate because the study sought to understand parents' experiences, beliefs, and decision-making processes concerning childhood COVID-19 vaccination rather than to measure relationships between variables. Qualitative inquiry enables researchers to obtain rich and contextualised information by allowing participants to express their views in their own words, thereby providing a deeper understanding of complex social and behavioural phenomena (Castleberry & Nolen, 2018, as cited in Squires, 2023).

Considering the public health restrictions during the COVID-19 pandemic, data were collected using an online open-ended questionnaire administered through Google Forms. This approach enabled parents from different backgrounds and geographical locations to participate safely while minimising the risk of virus transmission. In addition, online qualitative questionnaires provide respondents with sufficient time to reflect upon and articulate their opinions, making them particularly suitable for exploring personal experiences and perceptions (Taylor, as cited in Hamilton & Finley, 2020).

The study was guided by the following research questions:

1. What decisions do parents or guardians make regarding the administration of the PICKids vaccine to their children?
2. What are parents' perspectives on childhood COVID-19 vaccination through the PICKids programme?
3. What factors influence parents' acceptance or hesitancy towards the PICKids programme?

Participants and Sampling

Purposive sampling was employed to recruit participants who met the specific inclusion criteria relevant to the objectives of this study. Since the PICKids programme specifically targeted children aged between five and eleven years, only parents or guardians with children within this age group were considered eligible to participate. This sampling strategy ensured that the collected data originated from individuals with direct experience and decision-making responsibility regarding childhood COVID-19 vaccination.

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The survey link was disseminated through commonly used communication platforms, including WhatsApp and email, to facilitate broad participation while adhering to movement restrictions imposed during the pandemic. These online platforms enabled efficient access to parents across different demographic backgrounds and geographical locations without requiring face-to-face interaction.

A total of 83 parents completed the questionnaire and fulfilled the inclusion criteria for analysis. Although the study did not seek statistical generalisation, the sample provided sufficient diversity of experiences to generate meaningful qualitative insights into parental acceptance and hesitancy towards the PICKids programme.

Research Instrument

Data were collected using a researcher-developed online questionnaire comprising two sections.

Section A consisted of eleven demographic questions designed to obtain participants' background information, including gender, age, educational level, occupation, number of children aged between five and eleven years, vaccination status, and personal experiences following COVID-19 vaccination.

Section B comprised nine open-ended questions exploring parents' perceptions of the PICKids programme. The questions focused on parents' views regarding childhood COVID-19 vaccination, reasons for accepting or rejecting the vaccine, perceived benefits and concerns, factors influencing their decisions, and sources of information that shaped their perspectives. One of the key questions specifically asked respondents whether they agreed or disagreed with vaccinating their children through the PICKids programme, followed by opportunities to explain the reasons underlying their decisions.

The use of open-ended questions enabled respondents to provide detailed explanations and personal reflections beyond predefined response categories, thereby enriching the qualitative data collected.

Data Collection Procedure

Data collection was conducted during the implementation phase of the PICKids programme using Google Forms. Participants voluntarily completed the online questionnaire after receiving information regarding the purpose of the study. Participation was entirely voluntary, and respondents were informed that their responses would be treated confidentially and used solely for research purposes.

The online approach was particularly appropriate given the public health circumstances during the COVID-19 pandemic, allowing safe participation while maintaining physical distancing requirements. No personally identifiable information was collected, thereby ensuring participants' anonymity throughout the study.

Data Analysis

Responses obtained from the open-ended questions were analysed using Braun and Clarke's (2006) six-phase thematic analysis framework. This approach was selected because it provides a systematic and flexible procedure for identifying, organising, and interpreting patterns of meaning within qualitative datasets (Christou, 2022).

The analysis began with repeated reading of all responses to achieve familiarity with the data. Initial codes were subsequently generated by identifying meaningful statements relevant to the research questions. Similar codes were then grouped into broader categories before being organised into potential themes. These preliminary themes were reviewed and refined to ensure internal consistency while maintaining clear distinctions between themes. Finally, each theme was clearly defined, named, and supported using representative quotations from participants to enhance transparency and credibility.

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To improve analytical rigour, two researchers independently coded the qualitative responses before comparing and discussing their interpretations. Any discrepancies were resolved through consensus, and where necessary, consultation with a third researcher was undertaken until agreement was achieved. This collaborative coding process enhanced consistency in theme development and reduced potential researcher bias.

Trustworthiness of the Study

Several strategies were employed to enhance the trustworthiness of the findings. Credibility was strengthened through repeated engagement with the dataset and independent coding by two researchers. Dependability was enhanced by maintaining a systematic coding procedure based on Braun and Clarke's established analytical framework. Confirmability was supported through discussions among the research team to minimise individual interpretation bias and ensure that themes accurately reflected participants' responses rather than researchers' assumptions. Finally, the inclusion of direct participant quotations throughout the findings section provides transparency and allows readers to evaluate the interpretation of the data.

Ethical Considerations

Participation in this study was voluntary, and respondents provided informed consent before completing the online questionnaire. Participants were informed about the objectives of the study, assured that their participation was anonymous, and advised that they could withdraw at any stage without any consequences. All information collected was treated confidentially and analysed only for academic and research purposes.

RESULTS

Demographic Profile of Participant

A total of 83 parents participated in this study. Table 1 presents the demographic characteristics of the respondents. Overall, female participants constituted the majority of the sample (79.5%), while male participants accounted for 20.5%. This distribution indicates that mothers were more actively involved in responding to issues related to childhood health and vaccination decisions.

With respect to age, most respondents were between 36 and 40 years old (39.8%), followed by those aged 40–45 years (21.7%) and 31–35 years (20.5%). Only a small proportion of respondents were below 25 years of age (2.4%). This age distribution reflects the typical age range of parents with children eligible for the PICKids programme.

Regarding educational attainment, most respondents possessed tertiary education qualifications. Degree holders represented the largest proportion of participants (42.2%), followed by respondents with Master's degrees (20.5%), Diplomas (18.1%), and SPM qualifications (15.6%). Only a small number reported lower educational qualifications.

Overall, the demographic profile suggests that the respondents consisted predominantly of mature and well-educated parents, providing a suitable foundation for exploring informed perspectives regarding childhood COVID-19 vaccination.

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Table 1. Respondent's Demographic Result

Variable	Category	n	%
Gender	Male	17	20.5%
	Female	66	79.5%
	Total	**83**	**100%**
Age	<25 years old	2	2.4%
	25-30 years old	4	4.8%
	31-35 years old	17	20.5%
	36-40 years old	33	39.8%
	40-45 years old	18	21.7%
	>45 years old	9	10.8%
	Total	**83**	**100%**
Educational Background	Not going to School	1	1.2%
	PMR	1	1.2%
	SPM	13	15.6%
	Diploma	15	18.1%
	Degree	35	42.2%
	Master	17	20.5%
	PhD	1	1.2%
	Total	**83**	**100%**

Parents' Acceptance of the PICKids Programme

The first research question examined parents' decisions regarding the administration of the PICKids vaccine to their children.

As presented in Table 2, most respondents expressed acceptance of the PICKids programme. Of the 83 participating parents, 59 respondents (71.1%) indicated that they agreed to vaccinate their children through the programme, whereas 24 respondents (28.9%) reported that they disagreed.

The findings demonstrate that although most parents supported childhood COVID-19 vaccination, a considerable proportion remained hesitant. This distribution indicates that parental decision-making regarding the PICKids programme was not homogeneous but reflected varying perceptions of vaccine benefits and risks.

Table 2. Response to Vaccination

Question	Response	n	%
Do you agree that vaccination through the PICKids program is given to your child?	Agree	59	71.1%
	Disagree	24	28.9%
	Total	**83**	**100%**

Themes Emerging from Parents' Perspectives

The qualitative analysis of the open-ended responses generated three overarching themes describing parents' perspectives towards the PICKids programme.

1. Trust in the PICKids vaccination programme
2. Concerns regarding vaccine side effects
3. Parental responsibility in protecting children's health

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These themes collectively explain the psychological and contextual factors influencing parents' acceptance and hesitancy towards childhood COVID-19 vaccination.

Theme 1: Trust in the PICKids Vaccination Programme

Trust emerged as the dominant factor influencing parents' acceptance of the PICKids programme. Parents who supported childhood vaccination consistently expressed confidence in scientific evidence, healthcare professionals, previous national immunisation programmes, and recommendations issued by the Ministry of Health.

Many respondents perceived the vaccine as an effective preventive measure capable of reducing disease severity and protecting children against COVID-19 infection. Several participants also referred to the successful implementation of previous childhood vaccination programmes as evidence supporting their confidence in the PICKids initiative.

Representative responses include:

"Children need to be protected, evidence shows higher number of long covid severe complication (MIS-C) in children." (Respondent 2)

"It has been given to many children around the world and thinking of the health & safety of our children." (Respondent 23)

"Vaccines are just like other injections such as BCG, Pneumonia, and others. Based on the global population graph and children's side effects, I believe vaccines can help prevent the spread and reduce the severity of symptoms." (Respondent 37)

"I give my child vaccine as a preventive measure." (Respondent 53)

"I have trust on this vaccine after readings on vaccine efficacy." (Respondent 53)

Apart from institutional trust, parents also acknowledged the influence of people within their social environment. Family members, spouses, healthcare professionals, and friends were frequently identified as important sources of encouragement that reinforced confidence in the vaccination programme.

Illustrative responses include:

"I get supported by my parents."

"I get supported from my family members."

"Friends encourage and influence."

"Doctors and other staff of MOH has encourage me."

These findings indicate that trust extended beyond confidence in the vaccine itself and encompassed trust in healthcare institutions, scientific evidence, and interpersonal relationships.

Theme 2: Concerns Regarding Vaccine Side Effects

The second theme reflects parents' concerns regarding the potential side effects associated with childhood COVID-19 vaccination.

Among parents who accepted the vaccine, side effects were generally perceived as manageable and outweighed by the protective benefits of vaccination. Many respondents viewed vaccination as an important preventive measure, particularly because children had resumed face-to-face schooling and were increasingly exposed to COVID-19 infection.

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Participants explained:

"Children are exposed to the COVID-19 virus when they are at school."

"To reduce the pain if they get the virus."

Conversely, fear of adverse effects represented the most prominent reason for vaccine hesitancy among parents who rejected the PICKids programme. Of the 24 respondents who disagreed with vaccination, 15 specifically cited concerns regarding possible side effects.

Typical responses included:

"I don't want to see my child receive the effects after the vaccine."

"I do not confident with the vaccine."

"I'm afraid of the side effects on my child after taking the vaccine."

These responses indicate that parents' decisions were strongly influenced by their perceptions of vaccine safety. Although many acknowledged the potential benefits of vaccination, uncertainty surrounding possible long-term consequences remained a significant barrier to acceptance.

Furthermore, hesitant parents frequently reported obtaining information from social media, family members, and personal experiences following adult vaccination. Such information sources often reinforced uncertainty and increased apprehension regarding childhood vaccination.

Theme 3: Parental Responsibility in Protecting Children's Health

The final theme reflects parents' strong sense of responsibility towards safeguarding their children's well-being. Interestingly, both parents who accepted and those who rejected the vaccine described their decisions as motivated by the same underlying objective—to protect their children.

Parents who accepted vaccination believed that immunisation represented a responsible preventive action capable of reducing children's vulnerability to COVID-19 infection. Vaccination was therefore perceived as an extension of parental duty to ensure children's health and safety.

In contrast, vaccine-hesitant parents believed that responsible parenting involved avoiding potential vaccine-related risks. Consequently, these parents adopted alternative preventive strategies, including adherence to standard operating procedures (SOPs), nutritional supplementation, healthy eating practices, and limiting children's exposure to crowded environments.

Several respondents explained:

"Medication and avoid children being in risky places and always follow SOPs." (Respondents 46 and 47)

"Always keep clean and eat nutritious foods." (Respondents 12 and 39)

Some participants also reported practising complementary approaches that reflected their personal beliefs regarding health protection.

Overall, the findings demonstrate that parental responsibility was interpreted differently depending on parents' perceptions of vaccine safety. While one group regarded vaccination as an essential protective measure, the other believed that avoiding vaccination constituted the safer option for preserving their children's health.

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DISCUSSION

This study explored parents' perspectives regarding Malaysia's National COVID-19 Immunisation Programme for Children (PICKids) and identified the factors influencing parental acceptance and hesitancy towards childhood COVID-19 vaccination. Overall, the findings indicate that although most parents demonstrated positive acceptance of the programme, a substantial proportion remained hesitant due to concerns regarding vaccine safety and potential adverse effects. The findings further suggest that parental decision-making is shaped by a complex interaction of trust, perceived risk, social influence, and parental responsibility rather than by medical evidence alone.

Trust as the Foundation of Vaccine Acceptance

The most prominent finding of this study is the central role of trust in shaping parents' decisions to vaccinate their children. Parents who accepted the PICKids programme consistently expressed confidence in scientific research, healthcare professionals, and the Malaysian healthcare system. Their willingness to vaccinate was further reinforced by previous positive experiences with routine childhood immunisation, leading them to perceive the COVID-19 vaccine as an extension of existing preventive healthcare practices rather than an unfamiliar intervention.

This finding supports the Health Belief Model (Rosenstock, 1974), which proposes that individuals are more likely to engage in preventive health behaviours when they perceive substantial benefits and believe that the intervention is effective in reducing health risks. Parents who trusted the vaccine believed that vaccination could effectively protect their children from severe COVID-19 infection, thereby outweighing any perceived disadvantages associated with vaccination.

Similarly, the findings correspond with the concept of Confidence within the 5Cs model of vaccine hesitancy (Betsch et al., 2018), whereby trust in vaccines, healthcare providers, and health authorities represents a fundamental determinant of vaccine acceptance. Parents' confidence was further strengthened through recommendations from healthcare professionals and positive experiences shared by family members, illustrating that trust is developed through both institutional credibility and interpersonal relationships.

The present findings are also consistent with previous Malaysian studies. Diana Leh Ching Ng et al. (2022) reported that parents who intended to vaccinate their children frequently cited protection of their children and confidence in vaccine effectiveness as their primary motivations. Likewise, Marzo et al. (2023) found relatively high willingness among Malaysian parents to vaccinate their children, reflecting the generally favourable public perception of COVID-19 vaccination in Malaysia.

Vaccine Safety Concerns as the Primary Source of Hesitancy

Despite the generally positive acceptance observed in this study, vaccine hesitancy remained evident among almost one-third of participants. The findings demonstrate that concerns regarding vaccine safety and potential side effects represented the principal barrier to childhood COVID-19 vaccination. Rather than rejecting vaccination entirely, many hesitant parents expressed uncertainty regarding the relatively recent development of COVID-19 vaccines and questioned their long-term safety among children. Such concerns illustrate that parental hesitancy is primarily driven by perceived risks rather than by opposition to vaccination itself.

These findings are consistent with the Health Belief Model, particularly the construct of perceived barriers, whereby concerns regarding adverse effects reduce the likelihood of engaging in preventive health behaviours (Rosenstock, 1974; Janz & Becker, 1984). Parents who perceived vaccine-related risks as greater than the benefits were more likely to postpone or reject vaccination.

The findings also support previous qualitative research conducted by Rumetta et al. (2020), which identified concerns regarding vaccine safety, limited knowledge, and uncertainty about vaccine necessity as common reasons for childhood vaccination refusal. Similarly, Diana Leh Ching Ng et al. (2022) reported that parents frequently questioned vaccine ingredients, expressed uncertainty regarding vaccine safety, and perceived insufficient information from healthcare providers.

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Interestingly, the present study suggests that parents' hesitancy was often reinforced by their own experiences following adult COVID-19 vaccination as well as information obtained through social media. This finding illustrates that parental decision-making extends beyond scientific evidence and incorporates personal experiences and informal information sources, which may substantially influence perceptions of vaccine risk.

The Influence of Social Environment on Parental Decision-Making

Another important finding concerns the influence of social relationships on parental vaccination decisions. Participants consistently reported that spouses, parents, family members, healthcare professionals, and close friends influenced their decisions regarding childhood vaccination.

This finding strongly supports the Theory of Planned Behaviour (Ajzen, 1991), which proposes that behavioural intentions are influenced by subjective norms or individuals' perceptions of important others' expectations. In the present study, healthcare professionals emerged as trusted sources of information among vaccine-accepting parents, whereas family members and social media appeared to exert greater influence among hesitant parents.

These findings indicate that vaccination decisions should not be viewed solely as individual choices but rather as socially negotiated decisions shaped by interpersonal communication and collective experiences. Consequently, public health campaigns should recognise the importance of engaging families and communities alongside individual parents when promoting childhood immunisation.

Parental Responsibility Beyond Vaccination

One of the most interesting findings emerging from this study is that both accepting and hesitant parents shared a common objective: protecting their children's health. However, they differed considerably in how they interpreted parental responsibility.

Parents who accepted the PICKids programme considered vaccination to be an essential preventive strategy that fulfilled their responsibility as caregivers. Conversely, hesitant parents believed that protecting children could be achieved through alternative approaches, including maintaining personal hygiene, following standard operating procedures (SOPs), improving nutrition, and providing dietary supplements.

This finding demonstrates that vaccine hesitancy should not necessarily be interpreted as parental neglect or irresponsibility. Rather, hesitant parents actively sought alternative strategies that they perceived to be safer for their children. Such findings reinforce the multidimensional nature of parental decision-making; whereby different parents prioritise different forms of risk reduction based on their personal beliefs and experiences.

Implications for Public Health Practice

The findings of this study carry several practical implications for public health policy and childhood immunisation programmes.

First, strengthening public trust should remain a central priority in future vaccination campaigns. Transparent communication regarding vaccine development, safety monitoring, and potential adverse effects may help reduce uncertainty among parents.

Second, healthcare professionals should continue to serve as primary communicators of vaccine information. Participants consistently regarded doctors and Ministry of Health personnel as credible and trustworthy sources of information, highlighting the importance of professional recommendations in influencing parental decisions.

Third, communication strategies should extend beyond simply providing scientific facts. Given the influence of family members and social networks identified in this study, future campaigns should adopt family-centred and community-based approaches that address emotional concerns alongside scientific evidence.

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Finally, the findings suggest that combating misinformation on social media remains essential for improving vaccine confidence. Public health agencies should therefore actively disseminate accessible, evidence-based information through digital platforms commonly used by parents.

Theoretical Contribution

This study contributes to the growing literature on childhood COVID-19 vaccination by providing qualitative evidence that complements existing quantitative studies conducted in Malaysia. While previous research has primarily examined statistical predictors of vaccine acceptance, the present study offers a deeper understanding of the reasoning, experiences, and interpretations underlying parental decision-making.

The findings further demonstrate that the Health Belief Model, the Theory of Planned Behaviour, and the 5Cs model remain useful theoretical frameworks for understanding parental acceptance and hesitancy within the Malaysian context. More importantly, the study illustrates how these theoretical constructs interact simultaneously rather than independently when parents make healthcare decisions on behalf of their children.

Overall, the findings suggest that parental acceptance of childhood COVID-19 vaccination should be understood as a dynamic decision-making process shaped by trust, perceived risk, social influence, and parental responsibility. Recognising the interaction among these factors may assist policymakers and healthcare professionals in developing more responsive and effective childhood immunisation strategies for future public health emergencies.

CONCLUSION

This study explored parents' perspectives regarding the National COVID-19 Immunisation Programme for Children (PICKids) in Malaysia and examined the factors influencing parental acceptance and hesitancy towards childhood COVID-19 vaccination. The findings demonstrate that although most parents supported the programme, vaccine hesitancy remained evident due to concerns surrounding vaccine safety, perceived side effects, and uncertainty regarding the relatively new COVID-19 vaccine. Three interrelated themes emerged from the qualitative analysis, namely trust in the PICKids programme, concerns regarding vaccine side effects, and parental responsibility in protecting children's health. Collectively, these findings indicate that parental vaccination decisions are not determined solely by scientific evidence but are influenced by an interaction of psychological, social, experiential, and contextual factors. Regardless of whether parents accepted or rejected the vaccine, all participants shared a common objective of safeguarding their children's well-being, although they differed in the preventive strategies, they considered most appropriate.

The study contributes to the existing literature by providing qualitative insights into parental decision-making within the Malaysian context, complementing previous quantitative studies on childhood COVID-19 vaccination. The findings also demonstrate the applicability of the Health Belief Model, the Theory of Planned Behaviour, and the 5Cs framework in explaining parental vaccine acceptance and hesitancy. These theoretical perspectives collectively illustrate that trust, perceived benefits, perceived risks, social influence, and collective responsibility simultaneously shape parents' healthcare decisions.

From a practical perspective, the findings highlight the importance of strengthening public confidence through transparent communication, evidence-based health promotion, and sustained engagement between healthcare professionals and parents. Future childhood immunisation programmes should adopt more family-centred communication strategies that address parents' concerns while reinforcing public trust in vaccination. Such efforts are essential to improve vaccine confidence and strengthen preparedness for future public health emergencies.

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LIMITATIONS

Several limitations should be considered when interpreting the findings of this study. First, the study employed purposive sampling and involved a relatively small number of participants. Although this sampling strategy was appropriate for exploring parents' experiences in depth, the findings cannot be generalised to the wider Malaysian population.

Second, data were collected using an online questionnaire distributed through WhatsApp and email during the COVID-19 pandemic. Consequently, parents with limited internet access or lower digital literacy may have been underrepresented, potentially introducing sampling bias.

Third, the study captured parents' perspectives at a single point in time during the implementation of the PICKids programme. As public understanding of COVID-19 vaccines continues to evolve, parental perceptions and decision-making may also change over time.

Finally, although open-ended online questionnaires enabled broad participation, they provided fewer opportunities for researchers to probe responses compared with face-to-face interviews. Future qualitative studies employing in-depth interviews or focus group discussions may therefore provide richer explanations of parents' beliefs and experiences regarding childhood vaccination.

FUTURE RESEARCH

Future studies should extend the present research in several directions. Longitudinal qualitative studies are recommended to examine how parents' perceptions of childhood COVID-19 vaccination evolve over time, particularly following the widespread implementation of vaccination programmes.

In addition, mixed-methods research integrating quantitative and qualitative approaches would provide a more comprehensive understanding of the factors influencing parental vaccine acceptance and hesitancy. Such studies could investigate the relationships between demographic characteristics, health literacy, trust in healthcare institutions, and vaccination behaviour while simultaneously exploring parents' lived experiences.

Future research should also examine the effectiveness of different health communication strategies in addressing vaccine hesitancy among parents. Comparative studies involving diverse ethnic, socioeconomic, and geographical populations within Malaysia would further contribute to developing culturally appropriate public health interventions aimed at strengthening childhood immunisation programmes.

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CONFLICT OF INTEREST

The authors declare that there are no financial or non-financial conflicts of interest regarding the publication of this manuscript.

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AUTHORS CONTRIBUTION

Iylia Binti Mohamad: conceptualization, methodology, investigation, data curation, formal analysis, writing the original draft, project administration, correspondence. Intan Farahana Abdul Rani: conceptualization, methodology, supervision, validation, writing; review and editing. Nur Ain Farhana Kariuddin: investigation, data curation, validation, writing; review and editing. Mohd Kamarul Amree Mohd Sarkam: formal analysis, validation, visualization, writing; review and editing. Nasehah Sakeenah Shamsul Bahrin: investigation, resources, validation, writing; review and editing.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

DECLARATION OF GENERATIVE AI

During the preparation of this manuscript, the authors used ChatGPT (OpenAI) to improve the clarity, grammar, and readability of the manuscript. Following the use of this tool, the authors carefully reviewed, revised, and accepted full responsibility for the content of the manuscript.

ETHICS STATEMENT

Participation in this study was voluntary. All participants were informed about the objectives of the study prior to data collection, and informed consent was obtained before participation. Respondents remained anonymous throughout the study, and all data were treated confidentially and used solely for academic purposes. Ethical approval: Not applicable.

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