The Universal Language of Story | Developing Model Narratives for Provider Parent Interactions to Guide Child Vaccination Decisions

by

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A thesis submitted in partial fulfillment of
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Master of Science in the Duke Global Health Institute
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ABSTRACT

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Abstract

Background: Vaccine hesitancy is driven by various contextual, group, and individual determinants and vaccine-specific factors. Vaccine hesitancy acts as a barrier to childhood vaccination. While literature suggests narrative communication may be influential in promoting health behavior, there needs to be more understanding of how narrative communication approaches can support parent-provider conversations around childhood vaccines.

The objectives of this study were to:

(1) Conduct a secondary analysis of in-depth interview data from parents and providers to identify commonalities within the decision-making process for parents making vaccine choices for their children and determine aspects of priority for providers when engaging in vaccine communication.

(2) Develop fictional narratives that represent the four distinct parental positions on childhood vaccination (unquestioning acceptors, cautious acceptors, go along to get along, late/selective vaccinators, and refusers)

(3) Assess the feasibility and acceptability of the fictional narratives to guide parent-provider communications related to childhood vaccines.

Methods: This study conducted a secondary data analysis from the study *Development and Testing of ADEPT: A Parent Decision Support for Childhood Vaccinations (ADEPT) by*

Vasudevan et al. Additionally, we recruited parents and healthcare providers to conduct interviews via zoom. We developed four fictional narratives by aggregating stories from healthcare providers currently administering childhood vaccines and parents of young children that followed a range of mothers making vaccine decisions and their varying concerns. In-depth interviews with vaccine-hesitant and nonvaccine-hesitant parents provided feedback on the acceptability and feasibility of these narratives.

<u>Results</u>: We interviewed five healthcare providers and 12 parents with children 3-6 years of age. Parents with shared decisions to accept, refuse or delay vaccines describe similar factors influencing their decision, such as family experiences and vaccine-specific concerns. Healthcare providers' steps in vaccine conversation first address parent concerns, create a trusting environment and provide a strong recommendation. Parents chose none, one, or multiple narratives they resonated with, and there was no relationship between vaccine decision-making history and the parental position represented in the narrative.

<u>Conclusions</u>: The results suggest that the providers approach vaccine conversation by understanding parents' perspectives and providing a solid recommendation. A multitude of factors influences parents' vaccine decisions. This study suggests the use of narrative in the distribution of healthcare information, and further research can further validate the narratives and refine them for broader use.

Dedication

This is dedicated to my family, whose roots continue to fuel my flourish, and to my mentor, whose counsel I greatly admire. Thank you.

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Acknowledgments

With deepest gratitude, I would like to acknowledge my committee, who have guided me throughout this entire process. Thank you for your dedication and a refinement process that truly transformed my approach to learning.

I want to thank my parents for reminding me that my dreams are boundless and for providing relentless love and support along the way.

Moreover, thank you to my sister, whose partnership throughout this program I could not have done without.

1. Introduction

1.1 Synopsis

Health providers often face the challenge of convincing vaccine-hesitant parents to accept vaccinations for their children. Growing evidence suggests that traditional communication strategies that involve sharing scientific facts, statistics, and recommendations have limited effectiveness with vaccine-hesitant parents. Alternative communication strategies that facilitate a discussion of parents' vaccine concerns may be needed. This paper reports the results of a qualitative study of the feasibility and acceptability of narrative communication. This approach relies on storytelling to facilitate provider-parent discussions on childhood vaccinations.

1.2 Childhood vaccinations

Childhood vaccinations prevent 4 million deaths annually, making them one of the most outstanding public health achievements (Ehreth, 2003). Since its inception in the 1970s, routine vaccination programs have dramatically reduced mortality for children under five from dangerous and sometimes deadly diseases such as measles, pertussis, and polio (Greenwood, 2014). A cost-effective analysis of the economic impact of vaccines in 73 low- and middle-income countries estimated that childhood vaccines have saved 20 million lives and $350 billion (about $1,100 per person in the US) in the last two decades (Estimated economic impact of vaccinations in 73 low- and middle-income countries, 2001–2020). Despite the evidence on the benefits and effectiveness of vaccines, many parents are hesitant to vaccinate their children. This is evident through how the rate of vaccinated children in the United States aged 0-35 months remains stagnant at around 74% (KFF, 2022). The literature suggests vaccine hesitancy is because of parental concerns such as low perceived disease susceptibility, severity, perceived lack of vaccine efficacy, vaccine safety, trust in healthcare professionals, and trust in the government (Salmon et al., 2005). The population-attributable fraction of unvaccinated children due to vaccine hesitancy varies by state and vaccine but ranges from 31.3% for the DTaP vaccine and 6.5% for the Hepatitis B vaccine in the United States (Nguyen et al., 2022). Reducing parental vaccine hesitancy is critical for increasing childhood vaccine uptake (Damnjanović et al., 2018).

1.3 Determinants of vaccine hesitancy

Vaccine hesitancy is a complex, multilayered phenomenon that can result in a spectrum of decision-making positions among parents (Leask et al., 2012). The different parent positions on vaccines, ranging from least hesitant to most hesitant, include unquestioning acceptors, cautious acceptors, hesitant, late, or selective vaccinators, and refusers, shown in Figure 1.

Unquestioning acceptor	Cautious acceptor	Hesitant	Late or selective vaccinator	Refuser
Parents who vaccinate their children without question	Parents who have minor concerns about vaccines but still vaccinate	Parents who vaccinate their children but have a lot of concerns	Parents who choose to delay vaccines for their children or only get some vaccines	Parents who refuse all vaccines for their children

Figure 1: Parent positions on vaccines adapted from Leask et al.

Each position on the spectrum may be influenced by a myriad of determinants described by the Strategic Advisory Group of Experts on Immunization (Table 1). These determinants include contextual factors, individual and group influence, and vaccine/vaccination-specific issues (MacDonald, 2015)

Table 1: The SAGE Working Group's Vaccine Hesitancy Determinants Matrix

CONTEXTUAL INFLUENCES *Influences arising due to historic, socio-cultural, environmental, health system/institutional, economic, or political factors*	a. Communication and media environment b. Influential leaders, immunization program gatekeepers and anti- or pro-vaccination lobbies. c. Historical influences d. Religion/culture/ gender/socio-economic e. Politics/policies f. Geographic barriers g. Perception of the pharmaceutical industry
INDIVIDUAL AND GROUP INFLUENCES Influences arising from personal perception of the vaccine or influences of the social/peer environment	a. Personal, family and/or community members' experience with vaccination, including pain. b. Beliefs, attitudes about health and prevention c. Knowledge/awareness d. Health system and providers-trust and personal experience. e. Risk/benefit (perceived, heuristic) f. Immunization as a social norm vs. not needed/harmful
VACCINE-SPECIFIC ISSUES Directly related to vaccine or vaccination	a. Risk/ Benefit (epidemiological and scientific evidence) b. Introduction of a new vaccine or new formulation or a new recommendation for an existing vaccine c. Mode of administration d. Design of vaccination program/Mode of delivery (e.g., routine program or mass vaccination campaign) e. Reliability and/or source of supply of vaccine and/or vaccination equipment f. Vaccination schedule g. Costs h. The strength of the recommendation and/or knowledge base and/or attitude of healthcare professionals

Contextual influences are environmental, social, political, and other factors that influence a parent's decision-making. Vaccine-specific issues include any factor related to the vaccine product or process of vaccination. The individual and group influences of the matrix describe how friends and family influence vaccine decision-making. A parent's decision to vaccinate their child(ren) is influenced by their individual experiences and the experiences individuals in their social environment share (Parvanta & Bass, 2020). Once made up of family members, coworkers, friends, and healthcare providers (Parvanta & Bass, 2020), social environments continue to expand with online social media platforms. (Haz et al., 2019).

1.4 Role of Narrative Communication

Although existing health communication persuades individuals to adopt health-promoting behaviors through logistical reasoning such as statistical evidence, logistical communication approaches are limited where morality and personal values are concerned (Hinyard & Kreuter, 2007). Health communicators are increasingly adopting narrative modes of communication to achieve similar outcomes (Hinyard & Kreuter, 2007).

A narrative is a type of storytelling defined as "a cohesive, causally linked sequence of events that takes place in a dynamic world subject to conflict, transformation, and resolution through non-habitual, purposeful actions performed by characters" and described as a tool for promoting behavior change (Hinyard & Kreuter, 2007, p. 2; Hopfer et al., 2017).

Identifying with a fictional persona or character within a narrative creates a para-social relationship or a pseudo-relationship between characters and readers (Kreuter et al., 2007). This is because perceived similarity, or likeness, contributes to para-social relationships where characters can evoke an emotional response and affect how people respond to health messages, and the more emotional a narrative is, the greater the perceived risk of vaccination (Betsch et al., 2011; Kreuter et al., 2007). A previous study by Massey et al. (2021) utilized social media platforms to influence health behavior by creating fictional personas to engage parents in conversations on Twitter about the Human Papillomavirus (HPV) vaccine for adolescents. There needs to be more understanding of how para-social relationships can influence vaccine behavior in healthcare settings.

Table 2 lists examples of studies that examine the relationship between narrative communication and HPV vaccine uptake amongst Latina and Vietnamese women in Southern California (Hopfer et al., 2017), influenza vaccination amongst adults living in Hong Kong (Jiang, 2021), and COVID-19 vaccination amongst refugee, immigrant, and migrant communities living in Minnesota (*Using Storytelling to Increase Vaccine Confidence | National Resource Center for Refugees, Immigrants, and Migrants (NRC-RIM)*, n.d.). These studies showed how individual and group influences affect vaccine decisions, including conversations with healthcare providers and family and the perceived disease risk.

Table 2: Summary studies on narrative use in vaccine communication.

Study	Sample	Narrative Use	Results
Hopfer et al., 2017	Women ages 18-26 who self-identified as Latina or Vietnamese	Interviews to understand influences and narratives impacting vaccine decision	Factors that affected a woman's decision to receive the HPV vaccine included conversations with mothers, healthcare providers. Will inform an HPV vaccine intervention
Jiang, 2021	Hong Kong adults who were either at high risk or had a high-risk family member	Participants were randomly assigned to watch a narrative video, an informational video, or no message	Narrative produced greater perceived threat of contracting influenza. Narratives work better for individuals with low health literacy
(NRC-RIM)	Refugee, immigrant, and migrant communities	Somali providers used storytelling to explain the COVID-19 vaccine	Encouraged community members to get vaccinated and mitigated misinformation

1.5 Use of narrative communication strategies in provider-parent interactions

The existing communication models for providers, the most trusted source of vaccine information, include Corroborate, About me, Science and Explain (CASE), Elicit, Acknowledge, Share, Explain (EASE), and Ask, Acknowledge, Advise, described in Table 3, ("KFF COVID-19 Vaccine Monitor," 2021).

The CASE approach encourages providers first to acknowledge parents' concerns, describe their expertise, explain the science, and give recommendations. EASE is a similar approach that begins by asking and acknowledging parents' concerns before describing the science behind vaccination. There is a growing need for healthcare providers to go beyond educating parents and providing vaccine recommendations, just like recommendations for other medical treatments. These structured approaches were developed based on that goal.

This study uses Ask, Acknowledge, Advise because although it is like the CASE and EASE, it is the sole framework of the three used to measure changes in vaccine confidence (Brewer et al., 2017). Additionally, it combines the third and fourth steps of CASE and EASE into Advice, which would condense categorizing provider statements during data analysis.

Table 3: Steps within existing communication models.

CASE	(1) CORROBORATE acknowledge parent's concerns	(2) ABOUT ME describe own vaccination expertise	(3) SCIENCE explain the relevant scientific findings	(4) EXPLAIN/ ADVISE give vaccine recommendation
EASE	(1) ELICIT parent's main concern	(2) ACKNOWLEDGE parents concern without judgement	(3) SHARE commitment to vaccination	(4) EXPLAIN the science
Ask, Acknowledge, Advise	(1) ASK parent for concerns	(2) ACKNOWLEDGE parent concerns without judgement	(3) ADVISE about vaccines with a plan of action at the end	

Other vaccine literature describes using narrative communication in healthcare to increase the perceived threat of disease and mitigate misinformation (Hopfer et al., 2017; Jiang, 2021). There needs to be more literature examining the effects of narrative communication on childhood vaccination. This study explores the acceptability and feasibility of a written narrative as a communication tool between healthcare providers and parents when making childhood vaccination decisions. The specific aims of the study are to:

(1) Conduct a secondary analysis of in-depth interview data from parents and providers to identify commonalities within the decision-making process for parents in making vaccine choices for their children and determine aspects of priority for providers when engaging in vaccine communication,

(2) Develop fictional narratives representative of four distinct parental positions on childhood vaccination (unquestioning acceptors, cautious acceptors, go along to get along, late/selective vaccinators, and refusers)

(3) Assess the feasibility and acceptability of the fictional narratives to guide parent-provider communications related to childhood vaccines.

If successful, this study will describe the feasibility and utility of narrative communication within healthcare settings when discussing childhood vaccines. While previous literature has assessed narrative communication and behavior change for other vaccine contexts, there needs to be more understanding of the impact of narrative communication on vaccine hesitancy for childhood vaccinations. Additionally, previous research has used narrative in forms such as social media, but this study is specific to healthcare settings.

2. Methods

2.1 Secondary data analysis

Secondary data were obtained from the study *Development and Testing of ADEPT: A Parent Decision Support for Childhood Vaccinations (ADEPT) by Vasudevan et al*. This study included interviews with 12 healthcare providers and 52 parents with children 3-6 years of age to inform the development of an educational intervention on childhood vaccinations. The interview guides in this study assess parents' vaccine acceptance by asking about vaccine decisions and the decision-making process. This study also asked parents about accessibility and affordability when vaccinating their children. Lastly, this study assessed which sources of information parents utilized and whether vaccine decisions changed over time.

2.1.1 Understanding how providers approach vaccine conversation

This study used applied thematic analysis for transcripts from interviews with healthcare providers first to identify common themes about the provider-parent interaction from the providers' perspective and specific keywords, followed by placing keywords into the public health story map (Figure 2). The latter is a model for crafting stories for public health through a series of strategies, from establishing a status quo to providing a call to action. The public health story map was used because it was developed for public health practitioners with health systems as a targeted audience. Additionally, it is derived from the hero's journey archetype, which includes a call to action, distinguishing it from other story maps such as the loss of innocence archetype and the bildungsroman novel. Eight steps were developed for public health practitioners to structure stories.

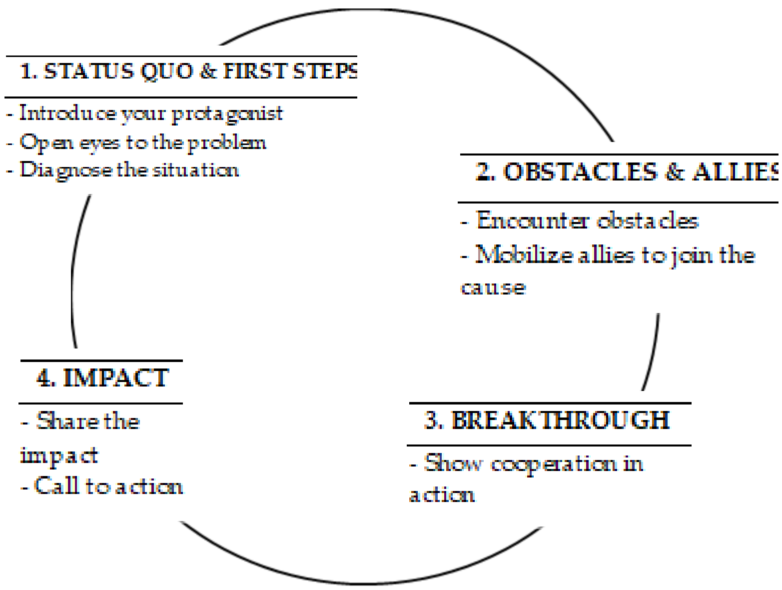

Figure 2: The Public Health Story Map

A codebook was developed to explore and collect information about how providers view and approach conversations about childhood vaccines with parents. This informed codes such as the age of children and more meaningful themes, such as visit output and provider approach (Appendix A). The second round of analysis defines keywords in the transcripts to match the steps outlined in the Public Health Story Map, as shown in Figure 3 (Appendix B).

Step in Public Health Story Map	Code from initial analysis
STATUS QUO & FIRST STEPS *introduce your protagonist, open eyes to the problem, diagnose the situation*	- Parent characteristics - Parent concerns - Age of children
OBSTACLES AND ALLIES *encounter obstacles, mobilize allies to join the cause*	- Existing sources of information - Socioeconomic status
BREAKTHROUGH *show cooperation in action*	- Trust - Provider approach - Language - Provider perspective
IMPACT share the impact, call to action	- Visit output

Figure 3: Organizing provider codes into the public health story map.

2.1.2 Understanding shared beliefs amongst parents with similar behavior.

An applied thematic analysis approach was used to examine interview transcripts from parents. Transcripts were pre-sorted by the ADEPT study team into categories representing parent positions, including unquestioning acceptors, cautious acceptors, go-along-to-get-along, late/selective vaccinators, and vaccine refusers. We identified themes in parents' experience with unquestioning acceptors, cautious acceptors, go-along-to-get-along, late/selective vaccinators, and vaccine refusers. We analyzed transcripts using the following codes: background understanding of childhood vaccination, provider behavior, change in vaccine beliefs and attitudes, information, parent perceptions about childhood vaccination, parent behavior related to childhood vaccination, and parent characteristics.

2.2 Developing fictional narratives.

We developed model narratives following secondary data analysis. Information from interviews with healthcare providers and parents was aggregated by sorting codes from parent and provider interviews with the public health story map. The researcher wrote four model narratives. There are four fictional mothers, one to represent unquestioning acceptors, one cautious acceptor, one going along to get along, and one late/selective vaccinators/refusers (late/selective vaccinators were combined with refusers for the narrative representing the far end of the vaccine hesitancy spectrum). Additionally, we integrated best health communication practices described in the literature, like maintaining a 6^{th} to 8th-grade reading level (Vandeberg et al., 2022).

In addition to the Public Health Story Map, narratives used Inclusive Communication Principles outlined by the CDC's (2022) Gateway to Health Communication. These include avoiding dehumanizing language and using person-first language to describe how groups are impacted by the system rather than using adjectives such as vulnerable, marginalized, underprivileged, and high-risk (CDC, 2022b).

We also followed The Narrative Paradigm, founded on the idea that humans are essentially storytellers and "narrative, whether written or oral, is a feature of human nature and it crosses time and culture (Fisher, 1987). Narrative probability and fidelity principles are outlined in this paradigm to develop coherent stories representative of actual lived experiences.

Narratives were developed and refined using the Flesch Kincaid Grade. Literature on health literacy and material readability suggests that “readability of patient education materials should not be higher than sixth- to eighth-grade level” (Badarudeen & Sabharwal, 2010, p.1).

2.3 Data collection to test the narratives

The methods of narrative evaluation (aim 3) are described using the 32-item COREQ (Consolidated criteria for Reporting Qualitative research) checklist to improve reporting quality and elicit transparency in research methods (Tong et al., 2007).

2.3.1 Research team and reflexivity

Personal characteristics: Interviews were conducted by Lisa Gachara. The author received guidance from individuals trained in qualitative methods.

Relationship with participants: No prior relationship was established with participants prior to study commencement. Participants were presented with an informed consent script describing the research's purpose, risks, and benefits of participation and study activities. The author completed a debriefing summary after every interview.

2.3.1 Study design

This study was an exploratory qualitative study.

Theoretical framework: The theoretical framework stated to underpin the study was the Narrative Paradigm.

Participant selection: Our study had two participant populations, parents of young children aged 3-6 and healthcare providers who regularly administer vaccines to children. We sought to interview 12 healthcare providers and 12 parents. We used purposive sampling based on pre-specified inclusion criteria to recruit parents and healthcare providers. The inclusion criteria included healthcare providers who regularly provided vaccine services and parents of children aged 3-6. Purposive sampling was used to recruit a 1:1 ratio of vaccine-hesitant to non-vaccine-hesitant parents. Participants received an advertisement through their Facebook or Instagram feed, which led them to a Qualtrics consent and eligibility survey to participate in the study.

Healthcare providers were also recruited using a purposive sampling approach. Healthcare providers were emailed a copy of the study flyer to forward to interested colleagues, who then had the opportunity to complete the consent and eligibility survey. Participants were approached via email. Snowball sampling was used to enhance recruitment, and healthcare providers who were approached for recruitment could share the recruitment email with their professional networks.

Setting: Interviews were conducted via phone or teleconferencing software.

Data collection: Two interview guides were developed for interviews, one to be used with healthcare providers and the other for parents (Appendix C).

Both interview guides had two sections. The first section was to understand existing perceptions and behavior related to childhood vaccination, and the second section was to gain feedback on the narratives (Figure 4).

CONCEPT OF INTEREST	MEASURES	POPULATION	QUESTIONS
Understand existing behavior	*Decision Making History*	Parents	- Describe your experience with deciding to vaccinate (or not vaccinate) [CHILDS NAME] - How have your conversations with your child's health provider impacted your vaccine decision making?
	Current Practices and Conversation Process	Providers	- How do you use your own personal experience or the experience of other vaccine-decision making parents during these interactions with parents? - What is your perception on the role that you play, as a provider in this interaction?
Test narratives	*Narrative feedback and acceptability*	Parents	- What would you change about this story so it is close to your experience when deciding to get [CHILDS NAME] vaccines? - With such changes in mind, would you utilize this storyline as a resource to receive vaccine information?
		Providers	- Which factors would hinder the use of this narrative in your interactions with parents? - How would you respond the concerns of parent #4?

Figure 4: Interview question examples.

Interviews were 45-60 minutes long using the teleconferencing software zoom to audio record. The first author transcribed interviews.

2.3.1 Analysis

Data analysis: Data were analyzed using thematic analysis. The author analyzed the data.

Major themes were identified using the Determinants of Vaccine Hesitancy Matrix. Statements about immunization behavior were categorized as either influenced by contextual, individual and group, or vaccine-specific factors to reduce data. Additional codes included specific things parents said about their relationship with their child's healthcare provider and where they source information about their child's health, not specified in the Determinants of Vaccine Hesitancy Matrix. These codes were structurally developed using the interview guide.

Provider transcripts were analyzed using the Ask, Acknowledge and Advise approaches to vaccine communication. Healthcare providers' conversation strategies were categorized as either invitational to parent questions (ask), empathetic of parent concerns (acknowledge), or educational of vaccine risks and benefits (advise).

Comments and feedback on the narratives were also analyzed. For parents, we coded which narratives they resonated with and why. We also coded whether parents reported narrative communication as useful in vaccine conversations. Lastly, we analyzed how a written narrative could be implemented.

We examined healthcare providers' existing use of storytelling in their interactions with parents. We also analyzed healthcare providers' acceptance of using written narratives in their practice. If healthcare providers accepted narratives, we sought to understand how they would integrate the medium into their practice. Finally, we analyzed feedback on the narrative content.

The IRB-approved transcripts were stored and accessed from a secure cloud server. Participant quotations were presented to illustrate the study findings, and these quotes have been de-identified.

Findings include a discussion of major and minor themes.

3. Results

3.1 Secondary Data Analysis

3.1.1 Understanding how healthcare providers approach vaccine conversation

Healthcare providers describe how a parent's decision to delay vaccines happens in the first six months.

Healthcare providers approach conversations with parents by first asking families if they have any concerns and addressing physical health and development before giving a presumptive statement such as "these are the shots you are getting today."

Healthcare providers prioritize language that is empathetic, probing, and understanding. After discussing their strong recommendation, if parents do not want to vaccinate, the conversation ends with healthcare providers sharing resourceful websites, including the CDC, National Immunization Information Initiative, and the American Academy of Pediatrics.

Under the public health story map, healthcare providers cooperate by informing parents of the next steps in the vaccine schedule, creating room for discussion.

3.1.2 Understanding shared beliefs amongst parents with similar behavior

Unquestioning acceptors: Parents who are unquestioning acceptors understand vaccines as a form of protection. Parents describe how healthcare providers explain vaccination schedules, benefits, risks, and side effects. Generally, parents' perspectives did not change over time. Parents described vaccinating their children based on information derived from their education or profession, internet searches, personal experience, and consultations with their pediatrician.

Cautious acceptors: Parents in the cautious acceptor category described strong belief in the efficacy of vaccination. Although they had concerns about side effects, they ultimately trusted the health system and healthcare providers and chose not to delay vaccines. The family's decision to vaccinate was often informed by their experience vaccinating their older children.

Go along to get along: Go along to get along parents had minimal interaction with healthcare providers. Much of their information was from online sources or other people's experiences. They describe having distrust in the medical system and potential side effects. Most parents in this category vaccinate because they must, usually under societal pressures such as school mandates.

Late/ selective vaccinators: Parents who vaccinate late or on a selective basis described mixed relationships with their child's healthcare provider. These parents are concerned about ingredients and how their children could react. By reading and talking with other parents, late or selective vaccinators often have their children vaccinated on a delayed schedule.

Refusers: Parents who refuse vaccines for their children express confidence in their decision. They worry about the number of vaccines and how their child(ren) could negatively respond to vaccination.

3.2 Narrative Development

Thematic findings from secondary data analysis were used to develop four fictional narratives. The narratives leveled around 300 words with a reading ease score of 65.2, as the literature suggests written materials should have readability no higher than 6th to 8th grade (Thompson, 2014).

Characters of these narratives include the moms of Hazel, Hamida, Sadiki, and Rupesh, representing the parents' beliefs and attitudes along the vaccine decision-making continuum.

Hazel's mom represents unquestioning acceptors. Multiple parents described an educational or professional background in the health sciences during interviews. Additionally, unquestioning acceptors display a strong trust in their healthcare providers. For example, parents stated,

"I feel like our primary care doctor is very committed," and "I am confident to ask the pediatrician."

Hamida’s mom represents cautious acceptors who described being concerned about side effects during interviews. Ultimately parents in this group trusted their healthcare provider’s recommendation and based a decision on their experience vaccinating their older children or how the healthcare provider described other children’s experiences. For example, one parent explained,

“If other kids are not having a reaction, it’s likely that she’s not going to have a reaction either.”

Sadiki’s mom is a character based on parents in the go-along-to-get-along category. During interviews, parents in this category describe hesitancy and concern about the ingredients in vaccines and their potential side effects. Many parents describe delaying their child’s vaccination until it was required saying,

“If it isn’t required by law or school, then I don’t do it.”

Rupesh’s mom’s character represents experiences described by late/selective vaccinators and vaccine refusers. In addition to being concerned about vaccines' ingredients and side effects, parents in this category describe external sources that inform their decision to delay or refuse vaccines, such as online blogs, parent forums, and mom groups. A parent describes their information search as,

"I just have to take the information that they're giving me and then add research on top of my own."

Table 4 describes the fictional mother's characteristics based on common themes derived from interviews with parents.

Table 4: Characteristics from narrative using parent behavior.

Character	Parent behavior	Introduce your protagonist (characteristics)
Hazel (Appendix D)	*Unquestioning acceptor*	Hazel's mom works in healthcare as a nurse. She is married and her husband is a scientist. Even though Hazel is their first child, they believe in science and they have a great relationship with Dr. Reid and so when he gives his recommendation, Hazel's mom doesn't give it a second thought.
Hamida (Appendix E)	*Cautious acceptor*	Hamida's mom has two kids. Her first born is now 3 and even though he has all his vaccines, she is wondering whether she should delay for Hamida. She is worried about the side effects, a concern she didn't think about with Hamida's brother. Shares her concerns with Dr. Reid and after he explains that bad reactions are rare, she trusts him and decides to have Hamida get her scheduled doses.
Sadiki (Appendix F)	*Go along to get along*	Sadiki's mom works at a big company in their town. She is concerned about the risks of getting him vaccinated, the side effects, and the ingredients and would ultimately prefer that Sadiki doesn't get vaccinated. But she must go back to work and Sadiki's daycare requires them. So, she ultimately decides to have him get his vaccines
Rupesh (Appendix G)	*Late/selective and refuser combined*	Rupesh's mom had a hard delivery, as he was born prematurely. Dr. Reid starts listing off the vaccines he missed last time and the ones due this visit, she is overwhelmed. He is still so small, and she worries it will be too much for him. She doesn't know what is in the vaccines, and she is terrified Rupesh could have a bad reaction. Dr. Reid gives her some resources and prompts her to return in a few weeks

The narratives describe parents making vaccine decisions during their 2-month well-child visit based on discussions with healthcare providers, including details on how they "counter a miseducation with an educational point" and describe the vaccine schedule's purpose to "prevent a set of really very serious illnesses."

One healthcare provider relays their response to a parent refusing vaccines: "here is a list of other websites I would like you to look at; let's come back, and we'll talk about it."

Table 5, outlining how Dr. Reid's character was developed based on interviews with healthcare providers, includes his bio, common themes found during secondary data analysis, and an excerpt from the dialogue between Dr. Reid and Rupesh's mom.

Table 5: Developing Dr. Reid's Persona Based on Provider Interviews**.**

Persona	Dr. Reid, MD, MPH *Pediatrician, Primary Care Doctor*
Bio	I'm Dr. Reid, unbeknownst to my mother who regardless of my height, age, academic accomplishments, or *marital status*, continues to refer to me as Chunk. I have always loved kids since I was one myself and was headstrong about becoming a pediatrician before I could pronounce the word (or understand it's lengthy process). Above health care delivery I value relationship building, health education, and every family I get to interact with on a daily basis. I studied Literature and Public Health at Indiana University, before getting my MD/MPH at George Washington University. Outside of healthcare my joys are simple, books, baked goods, and discovering new places.
Approaches Described in Secondary Data	- Explain each vaccine, when they're due and what they do - Provide information but create a conversational environment to show parents they are in control - Share their personal experience, including one's with own kids as an anecdote - Introduce the vaccines due at the next visit - Provide a list of resources and information if parents decline vaccines
Narrative Excerpt (*Rupesh*)	"Because he didn't get his Hepatitis B and Rotavirus vaccine during our last visit, Rupesh has 6 vaccines due today." I watched cautiously as Dr. Reid continued to examine him. "DTaP," he added, "Hib, PCV13, and IPV included. As- " "Dr." I objected. "You know my concerns. As a preemie, Rupesh is still so tiny. I'm his mother and I want to make decisions that are best for him." He nodded in understanding. "It's just all really scary." I shared. "On top of it being so many vaccines for his little body, what are the side effects? Ingredients? How do I know he isn't allergic?" "I get it," he sympathized, "I was born prematurely too and my mom was a forcefield around me, always making sure I was safe. Though my concern is, this would start a sequence of vaccines, which would continue during his 4-month and 6-month visit. And I know you know that I really recommend following the schedule to prevent very serious diseases." "We are very careful with him, I don't see how he could contract these diseases, like Hib." I explained "Okay," Dr. Reid acknowledged. "Here is a list of websites I want you to look that. After that I will answer any more questions, you may have. Please come back in a couple of weeks."

3.3 Story Telling Results

We received over sixty-five responses to the eligibility survey. We recruited twenty-four participants in the order that they completed the survey. This included six healthcare providers and eighteen parents. Eighteen participants were interviewed, and seventeen were included for data analysis, as one interview was discontinued for concerns about validity. Results include five healthcare providers who provide vaccination services to children and twelve parents. This study included six parents who were vaccine-hesitant and six who were non-hesitant. Parents were not screened as unquestioning acceptors, cautious acceptors, go-along-to-get-along, late/selective vaccinators, or refusers. Vaccine hesitancy was determined based on the screening question, "For reasons other than illness or allergy, have you ever delayed or refused vaccines for your child?" (Marshall et al., 2021).

3.3.1 How healthcare providers initiate vaccine conversation using Ask, Acknowledge and Advise

Ask: All healthcare providers describe the importance of meeting parents where they are at. In the ask phase of this communication approach, healthcare providers begin by understanding parents' concerns.

The following quote is from a healthcare provider exampling the "Ask" step of the framework:

"What it is that they've heard or you know experience themselves or with their other kids or what stories that they've heard from other people you know just you know what that is what information that they're you know you know basing on that.

Trying to you know really understand what it is that that's you know, causing them to you know to be you know to be you know hesitant what is it that they've heard."

Acknowledge: Healthcare providers describe how they approach creating a trusting environment with parents by acknowledging parents' past experiences, emphasizing clear communication, and building a trusting environment. Table 6 includes how health providers acknowledge parents' concerns by understanding how experience influences current beliefs, repeating what parents shared before moving on in the conversation, communicating a shared understanding, asking what their role should be, and creating awareness on how they respond to hesitant parents.

Table 6: How healthcare providers acknowledge parents' concerns to build a trusting environment.

Understand how past experiences influence current beliefs	*Repeat what parents shared before moving on in conversation*	*Communicate an understanding has been met*	*Ask how healthcare providers can best meet their needs*	*Being aware of how they are responding*
"As a medical practitioner of all learn to work on your relationship with the parents, building a level of confidence, a level or trustworthiness. You should understand that they have prior experience like they have gotten some probably negative experience from their, uh, past visits to the hospital."	"Okay, so you told me a story, let me tell you what I heard, to make sure I heard it correctly, and then correct me if I misunderstood something. I understand such and such is going on. Did I get that properly or did I miss the point. They go no you heard me, you heard me. I go great."	"Ask them what's… why… what is making them hesitant? Then when they tell you, you make you make it clear to them, you make them understand."	"Ask if there are things I can do to earn their trust that I haven't done already. I really, I want it to be you know a trusting relationship and I want them to feel really good about the care that they're giving their children."	"Trying to you know really understand what it is that that's you know causing them to you know to be you know to be you know hesitant what is it that they've heard. Trying to do that in a non-threatening thing just so I can understand where that hesitancy is coming from."

Advise: Healthcare providers approach to providing a recommendation for vaccination include:

A healthcare provider exampled "Advise" through:

(1) Building confidence

"I basically make them confidence in taking the vaccine. They're always scared about the side effects so I basically just tell them the positive side of vaccines. I'll tell them the dosage of the vaccine their child is about to take. And I will tell them I'll tell them taking the vaccines will help them."

(2) Mitigate misinformation

"As a health care provider, I would shed, shed the light on the rumors or information they may have gotten online. I would tell them what is true, what is false, and what would happen."

(3) Create space to discuss vaccination further

"I'm a big believer and let's talk again. Um, you know, keep the conversation going. It implies a future partnership.

'Would you mind if we had another conversation, you know, in a month, and maybe you'll have had the chance to read this stuff that I've just given you and talked to some family members and you know, consult with your church…'"

Providers also described other communication approaches, including using their personal narrative as an anecdotal source of information amongst other personal tools. These tools and accounts from healthcare providers are outlined in Table 7.

Table 7: Healthcare providers' tools and use of personal narrative.

How healthcare providers use narrative already	- *"I advise it pretty strongly because I've seen a lot of kids really not do well when they haven't been vaccinated."* - *"These are things you know either I've done my you know I've had myself or you know you know all my kids had you know I had this. - I'm not asking you to do anything more than what I've already you know already done my you know myself."*
Communication Strategies	- *"Put it in fairly simple terms instead of putting just too much in our doctor speak or medical speak. Shots instead of immunizations. Muscle aches instead of you know the word myalgias. Limiting the number of acronyms most of our patients don't know those."* - *"We're gonna watch this TikTok together.* *A lot of it these days is social media and so a lot of what I try to do is to figure out you know why it is that their trust is in social media? And what about that social media has earned their trust?"*

3.3.2 Parents existing attitudes and behaviors using The Vaccine Hesitancy Determinants Matrix

Of the twelve parents we interviewed, seven accepted vaccines for their children, four described delaying, and one refused. Most parents were women (n= 11) between the age of 30-40 (n= 6). Additionally, (n= 9) of parents were Caucasian or white, 9 had a bachelor's degree or higher, and ten were married. Six parents had private insurance, while the other 6 had Medicaid.

7 of 12 parents described contextual factors that influenced their vaccine attitudes and behaviors, such as how they perceive the pharmaceutical industry and the political environment in the United States; quotes detailing these factors are in Table 8.

Table 8: Contextual influences described by parents.

Perception of the pharmaceutical industry	- *"I call it McDonald medicine. It's like factory medicine. They don't care about your kids. They just wanna push what they wanna push, work their way."* - *"When I'm handed a piece of paper that's made by these people that are making money for each vaccine being given, um listening to a doctor that gets bonuses for reaching their goal threshold those vaccinated patients that's significant bias. Chronic health conditions are very lucrative to the government to help organizations. Healthy people don't cost money you know healthy people don't make pharmaceutical companies money."*
Politics/ Policies	- *"It's really tough in the United States cuz you do. I mean, cuz you do have to return within the first three months. Um, and you know, if it had been my decision, I probably wouldn't have gone back to work financially that doesn't work. So, and if I had had to send the boys to a regular daycare, I would've been more concerned about the shots."* - *"And it was a lot easier to do because she was only child, she wasn't in daycare, she stayed home her family so it's a lot easier for us to be able to do that. But like even going to school nowadays it's required."*

Nine parents described individual and group factors in discussing vaccine behavior and beliefs, especially personal, family and community members' experiences. One mother describes how a coworker impacted her decision to shift to a delayed schedule:

"I started talking to people, and another lady that I work with sat across from me at work and, and she was doing that schedule."

Most (n= 11) parents explain vaccine-specific issues in their decision to vaccinate or not vaccinate their child(ren). Many parents describe their perceptions of risks and benefits.

"*Looking at risk of exposure, you know inner cities higher risk of disease transmission, rural countryside lower risk. My kids aren't participating in gay sex, IV drug use, and, you know, working as healthcare workers, you know, that's... those are the big ways that that HepB spreads*."

3.3.4 Narrative feasibility and acceptability, and feedback as described by healthcare providers and parents

Six parents answered, 'yes' to the question, "Would you utilize this storyline as a resource to receive vaccine information?" Meanwhile, 4 of 5 healthcare providers accepted narrative communication in their practice.

Providers and parents gave different accounts of how to use the narratives in healthcare settings. Healthcare providers discussed the narratives being feasible as a guide to ask questions, pamphlets to distribute to families, and training material for residents. Parents also suggested including the narratives in a pamphlet or developing them into a measurement tool that screens for vaccine hesitancy. These recommendations are outlined in Table 9.

Table 9: How would you use this narrative?

Providers	Parents
GUIDE *"I'm using this as a guide to ask questions or to help with patients."* **PAMPHLETS** *"Pamphlets to hand out for families with educational material and they would be material that I've read through that I'm comfortable with."* **TRAINING** *"I think this could be more interesting for healthcare providers to be able to run through some role-playing of talking to people about you know vaccine hesitancy. Having one be the parent you know in pushing back and the other you know trying to see about 'how do I incorporate some of these different tools if this is what I encounter?'"*	**PAMPHLET** *"Pamphlet that you kind of give like with discharge. 'You're going to be doing for these vaccinations with your pediatrician' and kind of like slipping it in there and just kind of have like these scenarios' stories along with like 'okay your two-week checkup this is what they're gonna go over.'"* **SCREENING** *"I could see it being used to help parents identify which parent they identify with? So that their pediatrician knows the best approach for them.* *I think if I had gone into my first pediatrician and said, 'I am parent one' maybe he would have tried a different approach with me in regard to my son and his milestones um and maybe I wouldn't have had to switch pediatricians."*

Specific Narrative feedback: Two parents described potentially using the narratives if specific changes were addressed. Most participants gave feedback on Dr. Reid's discussion on vaccines with Rupesh's mom, the fictional vaccine refuser. It was requested that her concerns were addressed within the conversation, and this was consistent with other feedback.

3.3.6 Resonance

Table 10 depicts which narratives parents resonated with, stratified by their vaccine decision-making history.

Table 10: Whether parents resonated with parent narrative based on vaccine decision

	Hazel	Hamida	Sadiki	Rupesh
Vaccine hesitant parents	3	2	3	3
Non-vaccine hesitant parents	5	4	5	4
Total	8	6	8	5

4. Discussion

4.1 Results and Recommendations

The main objective of this study was to explore the acceptability and feasibility of narrative communication in vaccine conversations between parents and healthcare providers. This was achieved through secondary data analysis and in-depth interviews with healthcare providers and parents.

The presumptive approach is described in communication literature as more effective in increasing vaccine acceptance compared to a participatory approach. (Mbaeyi et al., 2020). The language often used in this approach is "Joe is going to get vaccines to protect against seven diseases today" (Mbaeyi et al., 2020). The healthcare providers interviewed in this study describe using this approach and give their strong recommendations. They describe framing language as "these are the shots you are getting today." The healthcare providers in our study also describe approaching hesitant parents by addressing their concerns to create a trusting environment before giving their recommendation. This sequence of steps is like the existing EASE, CASE, and Ask, Acknowledge, Advise communication frameworks (Brewer et al., 2017). Healthcare providers should allocate time before vaccination in case parents have concerns after being strongly recommended. This could include having a separate health educator come into the examination room to address parents' questions before the healthcare provider comes to give the vaccine. Our findings indicate that parents with similar vaccine behavior also share beliefs and attitudes about interacting with their healthcare providers. For example, unquestioning acceptors and cautious acceptors describe having a strong trust in their healthcare provider and their vaccine recommendation. This is consistent with the literature that describes good relationships between healthcare providers and unquestioning acceptors (Leask et al., 2012).

Conversely, vaccine-hesitant parents in our study describe little trust in their healthcare provider and their vaccine recommendation. This includes looking to outside sources of information, described in the literature as a theme amongst late/selective vaccinators and vaccine refusers (Leask et al., 2012). Providers should include in their notes the concerns parents expressed during the visit about getting the vaccine and the factors that influenced their decision. This would ensure that the conversation between providers and parents is ongoing, and they can continuously address vaccine perceptions.

Shared beliefs and ideas amongst parental positions informed the stories' fictional personas, including their questions, opinions, and behaviors. This process is similar to a study by Massey et al. (2021), where the fictional personas described one's beliefs toward vaccination and overall lifestyle. Although, this study integrated qualitative and quantitative data to understand parents' vaccine decisions. A mixed-methods approach could have also been advantageous in developing the narratives for this study.

Parents in this study describe their vaccine decisions as being influenced by how they perceive the risks and benefits of vaccines, how family and friends share their experiences, and other influences such as perceptions of the pharmaceutical industry and politics. Parents' vaccine decisions being influenced by a variety of factors is consistent with the literature, where parents described their vaccine decision as being influenced by their lifestyle, perception of health, perception of diseases, perceptions about vaccine effectiveness and vaccine components, their social environment, and trust in institutions (Harmsen et al., 2012). The current literature written for healthcare providers to successfully dialogue with parents does not address the specific influential factors parents identified. The WHO (World Health Organization) lists communication strategies such as acknowledging benefits and risks and keeping the conversation going. However, no existing example anticipates parents' concerns and gives specific examples of how providers could respond (WHO, 2012). Future studies should create narratives based on the influential factors described by parents.

A scoping review of intervention studies to encourage HPV vaccination using narratives found that most studies specified the theories and models used to create the narratives. Authors recommend that future studies create narratives based on theories to facilitate measuring the constructs of theories and discuss the intervention effects based on the theoretical frameworks (Okuhara et al., 2023). Nevertheless, future narratives developed for vaccine conversations between healthcare providers and parents should integrate messaging rooted in communication theory and the health belief model, as they might be most relevant to vaccine behavior change.

In related work, a narrative-based behavior change intervention developed for smoking cessation amongst African Americans in the United States had a development process that included narrative collection, review, editing, and pilot testing (Houston et al., 2011). In our study, parents identified none, some, or multiple narratives they resonated with. This is inconsistent with the parental positions described in the literature and could result from a lack of cognitive and validity testing before interviewing.

4.2 Study strengths and limitations

The present study had several strengths and limitations that should be taken into consideration when interpreting the results. One strength of the study was its rapid analysis despite the short timeline, which allowed for quick dissemination of findings. However, this expedited process may have compromised the thoroughness of the analysis, which could have been improved with more time and resources. Additionally, while the use of memos after interviews helped to minimize bias, the study could have benefited from multiple interviewers to increase the reliability of the data.

One limitation of the study was the recruitment of participants solely through social media. The use of more varied sampling methods may have resulted in a more representative parent population. Furthermore, the results of the study may not be generalizable beyond the sample of English-speaking mothers in the United States. Therefore, caution should be exercised when applying these findings to other cultural and geographical contexts, as they may not be representative of those populations. Overall, these strengths and limitations highlight the need for future research to further explore the effectiveness of narrative communication in the context of childhood vaccination.

5. Conclusion

5.1 Summary

Childhood vaccination is a critical public health intervention that can prevent millions of deaths globally. This study aimed to explore the potential of narrative communication between healthcare providers and parents in discussing childhood vaccines. Narrative communication has been shown to be effective in promoting behavior change, and the results of this study provide insights into the current communication practices between healthcare providers and parents, as well as the perceptions of parents towards childhood vaccination. These findings align with existing literature on parental positions and behavior approaches.

Given the declining vaccination rates in the United States, it is crucial to enhance the capacity of provider-parent interactions in addressing vaccination concerns. This can be achieved by addressing parents' concerns thoroughly and providing information about the adverse effects of the diseases vaccines can prevent. Furthermore, exploring narrative communication in vaccine conversations could potentially contribute to increasing vaccine uptake and prevent vaccine-preventable deaths.

The Centers for Disease Control and Prevention (CDC) predicts that childhood vaccination can prevent 51 million deaths globally from 2021 to 2030. Therefore, it is imperative to continue researching effective strategies to improve vaccine uptake and reduce vaccine hesitancy. The findings from this study provide a foundation for further exploration of the potential of narrative communication in promoting childhood vaccination.

5.2 Future Implications

5.2.1 Implications for further research

There are many ways to communicate with parents about vaccines. However, narratives for conversations between healthcare providers and parents could be further researched and developed. This is needed to understand whether different types of narratives affect different individuals, the impact of real-life personal stories compared to fictional ones, and which presentation format is most salient for vaccine uptake. Future research and development could include cognitive testing, such as content elicitations and validity testing, to understand these concepts further. These methods help researchers understand how participants comprehend and interpret the content of the narratives. Focus group discussions with parents and healthcare providers could also be used to analyze whether the narrative is understood as intended and would help understand perspectives that parents and healthcare providers agree and disagree on. Additionally, future narratives could be developed as per the vaccines recommended at a specific well-child visit, and this would clarify the impact of narrative communication on vaccine decisions.

By 2030 measles and hepatitis b vaccination can save 33 million lives combined. Further narrative development can begin by addressing these routine vaccines because of their projected impact on global health. It is pertinent to prioritize communicating about these vaccines since the first dose of Hepatitis B is due at birth.

5.2.2 Implications for policy and practice

Addressing vaccine hesitancy requires a multifaceted approach that involves policymakers, healthcare providers, and public health officials. By implementing evidence-based strategies that address the determinants of vaccine hesitancy, policymakers can increase vaccination rates, reduce the incidence of vaccine-preventable diseases, and ultimately improve public health outcomes.

Improve vaccine education: Provide parents with comprehensive, evidence-based information on the benefits and risks of vaccines, as well as information on the diseases they prevent. This can be done through educational campaigns, public service announcements, and social media outreach.

Address vaccine misinformation: Combat vaccine misinformation by working with social media platforms to remove false information and partnering with trusted community leaders and organizations to provide accurate information.

Train healthcare providers: Provide healthcare providers with additional training on how to address vaccine hesitancy and effectively communicate the benefits of vaccination to parents.

Overall, a multi-faceted approach is needed to address vaccine hesitancy and increase vaccine uptake. By addressing the various determinants of vaccine hesitancy and providing parents with comprehensive, evidence-based information, we can work towards increasing vaccine acceptance and improving public health.

Appendix A

Provider Codebook

Preliminary Reading

Parent concerns

Parent characteristics

Sources of information

Trust

Approach

Language

Output

Other

Insurance

Socioeconomic status

Provider perspective

Appendix B

Provider Codebook

Secondary Reading

STATUS QUO & FIRST STEPS

introduce your protagonist, open your eyes to the problem, diagnose the situation

parent characteristics

parent concerns

overstimulation

age of children

OBSTACLES & ALLIES

encounter obstacles, mobilize allies to join the cause

existing sources of information

socioeconomic status

BREAKTHROUGH

show cooperation in action

trust

provider approach

language

provider perspective

IMPACT

share the impact, call to action

visit output

Parent Codebook

Background understanding

information/ perceptions that led to behavior

Provider behavior

What did healthcare providers do, say, etc.?

Change

Have perceptions and behaviors changed over time? Why or why not.

Information

What informed/ led to behavior?

Parent perceptions

Almost direct quotes that highlight behavior

Parent behavior and characteristics

Appendix C

Parent Interview Guide

Part A: Decision Making History
1. Describe your experience with deciding to vaccinate (or not vaccinate) [CHILDS NAME] How have vaccines have impacted your family? How did your decisions to or to not vaccinate contribute to this experience? 2. How do you understand the role of vaccines in your child's health? Has your understanding of the role of vaccines changed from your initial thoughts when your child was an infant? [If applicable] Have you expressed your concerns to a health care professional? 3. How have your conversations with your child's health provider impacted your vaccine decision making? Can you describe one of those conversations? Can you describe how you felt during this conversation? Probe for more experiences 4. Describe your thought process when a doctor says your child has a vaccine due today. What is the biggest factor for whether you decide to vaccinate or not? 5. How has healthcare information been shared with you in the past from healthcare providers? Was it an effective way to share information? 6. Which sources of information do you use outside of what the doctor tells you? In other words, where do you go to receive vaccine information on your own?
Thank you. In the next set of questions, we would like your input on the model narratives. Before we proceed, is there an aspect of the interaction that is did not ask about that you would like to speak about?

Part B: Narrative feedback and acceptability
1. Generally, what are your initial thoughts after reading this storyline? 2. Has it changed your thoughts about your interaction with healthcare providers regarding [CHILDS NAME]'s health? Did it change what you think about getting vaccines for [CHILDS NAME] 3. After reading this story, what are some things you have experienced that were not talked about? 4. With that in mind, what would you change about this story so it is close to your experience when deciding to get [CHILDS NAME] vaccines? 5. With such changes in mind, would you utilize this storyline as a resource to receive vaccine information? 6. Are there any final thoughts about this narrative that I have not asked about?
Thank you for participating, do you have any further questions? [If no, enforce the use of the number that was provided at the beginning for any questions that come up.]

Provider Interview Guide

Part A: Current Practices and Conversation Process
1. Imagine there is a new family in your practice, and it is time for their two-year vaccines. This family has two children with autism, which has contributed to their cautious mindset when it comes to vaccines. Describe how you would approach conversing with this parent about the vaccines due at this visit. Which anecdotes would you present to mitigate the emotions described? • **[a]** How does conversation develop as the parent displays sentiments of acceptance or hesitancy? • **[b]** Please provide an example of a concern that would commonly be expressed in this scenario and your response. 2. Imagine there is new family in your practice, and it is time for their two-year vaccines. This parent expresses how her hesitancy has been suppressed due to vaccines being embedded in societal requirements, namely school systems. Because of this, despite of her apprehensiveness, she is likely to adhere to maintain peace. Which anecdotes would you present to mitigate the emotions described? [***follow up prompts A and B***] 3. Imagine there is a new family in your practice, and it is time for their two-year vaccines. This parent describes an event of hospitalization that they believe was a result of their son receiving multiple vaccines at one visit. Because of this, they are acceptant of the vaccines due at this visit but will only take two of them today and will come back for the remaining ones. Describe how you would approach conversing with this parent. Which anecdotes would you present to mitigate the emotions described? [***follow up prompts A and B***] 4. Imaging there is a new family in your practice, and it is time for their two-year vaccines. They are here for their second born daughter and display strong feelings of vaccine refusal. This is due to their experience vaccinating their first-born son and describe his emotional and behavioral regression as due to vaccine injury. Describe how you would approach conversing with this parent. Which anecdotes would you present to mitigate the emotions described? [***follow up prompts A and B***]

5. How do you use your own personal experience or the experience of other vaccine-decision making parents during these interactions with parents? 6. What is your perception on the role that you play, as a provider in this interaction? • Some common points of conversation your described throughout each scenario includes ________. How do you see yourself as a health educator during this interaction?
Thank you. In the next set of questions, we would like your input on the model narratives. Before we proceed, is there an aspect of interacting with parents you would like to speak to that was not prompted?

Part B: Narrative feedback and acceptability
1. When reviewing this narrative, what are some gaps in information that you prioritize communicating with parents? 2. How would you respond the concerns of parent #4? 3. How does this narrative represent or not represent your position in this interaction? 4. What would you change, include, or remove from this narrative to better reflect the reality of your interactions with parents? • After those necessary changes, how feasible would it be for you to utilize these model narratives when discussing child vaccinations with parents? 5. Which factors would hinder the use of this narrative in your interactions with parents? 6. Are there any other discussions points that I did not ask about that you would like to speak to?
Thank you for participating, do you have any further questions? [If no, enforce the use of the number that was provided at the beginning for any questions that come up.]

Appendix D

Hazel | *Unquestioning Acceptors Narrative*

"Hello Hazel! How you are today?" Dr. Reid said to Hazel in an excited baby voice that made her immediately turn and smile at him.
"And how are you mom?" He asked me.
As I bounced her in my lap I responded, "We're doing well, thank you doctor."
"Well, great! Before we start, is there anything you want to talk about her health or growth?"
I didn't, so we went on with the rest of the visit. Even though Hazel is our first child, we were here last month for her 1st month visit and I knew this one would be similar.
After checking her weight and height, Dr. Reid turned to me and said "Since she got her second Hepatitis B dose last visit, Hazel has 5 shots due today. Rotavirus, DTaP, Hib, PCV13, and IPV. These shots protect your baby from illnesses like pneumonia, diarrhea, whooping cough, and polio, all of which can have serious consequences for babies. My daughter is almost 1 now, and we got the same vaccines for her when she was 2 months old. So, do you have any questions?"
I shook my head. "Nope! I got chickenpox as a kid and would not want her to go through anything similar, especially when it can be prevented."
My husband and I always knew we were going to vaccinate. It was never really a conversation we sat down to decide on. We did investigate which vaccines were recommended at what ages, so we could follow that schedule. On top of my science background and understanding vaccines from that perspective, I truly trusted Dr. Reid and his recommendations.
So, we continued with the shots. Hazel cried and Dr. Reid explained she might be fussy or have a fever but will be okay. He also told me we will get the 2nd doses of these at her 4-month visit.

Appendix E

Hamida | *Cautious Acceptors Narrative*

I moved Hamida from one hip to the other as Dr. Reid entered. “Hi Hamida, hi mom,” he greeted us. “How are we doing today?” “Doing good,” I responded.
Before continuing with the visit, Dr. Reid asked if I had any concerns about Hamida’s development. I explained she wasn’t eating well so we talked about that for a bit before he went on with the checkup.
“It looks like Hamida has 5 shots due today. Rotavirus, DTaP, Hib, PCV13, and IPV. These shots protect your baby from illnesses like pneumonia, diarrhea, whooping cough, and polio, all of which can have serious consequences for babies. My daughter is almost 1 now, and we got the same vaccines for her when she was 2 months old.”
“I’m worried about the side effects. I explained. “How have other kids reacted in your experience?”
“It depends,” he said. “Some babies get fevers or are tender at the spot where they got the shot. But those side effects go away in a day or two. Other kids don’t have any side effects at all. As for the really, really bad reactions, those are rare and unlikely.”
He was right. My first-born, now 3, didn’t experience any side-effects. I thought to myself whether it was worth getting the shots and ultimately decided if she will be protected from life- threatening illnesses, she needs to have it.
Even though I did have more concerns I trusted Dr. Reid and his recommendations. So, we continued with the shots. Hamida cried and Dr. Reid explained she might be fussy or have a fever but will be okay. He also told me we will get the 2nd doses of these at her 4-month visit.

Appendix F

Sadiki | *Go Along to Get Along Narrative*

One by one, I ungripped Sadiki's tiny but mighty fingers from my earring as someone knocked on the door.

"Come in!"

"Hi Sadiki," Dr. Reid said in a sing-songy voice while entering the room. He continued to sit at the computer and asked me, "How are you doing today?"

"Doing well," I responded with a smile.

"2 months old today!" He spoke excitedly to Sadiki. "And growing well. Do you have any concerns you want to talk about?

"None that I can think of." I responded "Well, why don't we get him on the table."

As I did so he began explaining, "Sadiki has 6 shots due today, including the two we didn't get last time, Hepatitis B and Rotavirus."

"I don't know if I want him to get his shots until he has to. Even personally, I don't really like taking medicine unless I truly need it," I began explaining.

"I really recommend following the vaccine schedule. These shots protect your baby from illnesses like pneumonia, diarrhea, whooping cough, and polio, all of which can have serious consequences for babies. My daughter is almost 1 now, and we got the same vaccines for her when she was 2 months old," He started. "Is Sadiki starting daycare soon?"

"Yes," I responded. "My company is adamant on me returning to the office the second he turns 12 weeks."

"Well, it's most likely that the daycare you want to enroll him in will require proof of vaccination. I suggest we begin them not so he doesn't have to get them all at once."

Understanding that this was a requirement, I went along with the shots. I didn't want to have to have him get so many at one time, and I definitely did not want to delay my return to work. Sadiki didn't even bat an eye, and Dr. Reid explained we will get the 2nd doses of these at his 4- month visit.

Appendix G

Rupesh | *Combined Late/Selective and Refuser Narrative*

"Good- "Dr. Reid began announcing as he entered the room. "Oh sorry" He mouthed as soon as he noticed Rupesh sound asleep on my chest.
"It's alright," I responded nervously.
"How are you doing today, Mom?" He spoke to me with a smile, before taking a seat at the computer.
"Well, thank you," I said.
"Looks like Mr. Rupesh is 2 months old and growing well," he started. "Do you have any concerns you want to talk about?"
I shook my head and he asked me to place Rupesh on the table.
"Because he didn't get his Hepatitis B and Rotavirus vaccine during our last visit, Rupesh has 6 vaccines due today." I watched cautiously as Dr. Reid continued to examine him.
"DTaP," he added, "Hib, PCV13, and IPV included. As- "
"Dr." I objected. "You know my concerns. As a preemie, Rupesh is still so tiny. I'm his mother and I want to make decisions that are best for him."
He nodded in understanding.
"It's just all really scary." I shared. "On top of it being so many vaccines for his little body, what are the side effects? Ingredients? How do I know he isn't allergic?"
"I get it," he sympathized, "I was born prematurely too and my mom was a forcefield around me, always making sure I was safe. Though my concern is, this would start a sequence of vaccines, which would continue during his 4-month and 6-month visit. And I know you know that I really recommend following the schedule to prevent very serious diseases."
"We are very careful with him, I don't see how he could contract these diseases, like Hib." I explained
"Okay," Dr. Reid acknowledged. "Here is a list of websites I want you to look that. After that I will answer any more questions, you may have. Please come back in a couple of weeks."
The list included the CDC, the National Immunization Information Initiative, the Johns Hopkins website, and more. I was eager to go do some research of my own.

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