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Influence of Social Media on Mothers' Decision-Making Regarding Vaccinations

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This is to certify that the doctoral dissertation by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Walden University
2024

Abstract

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MSN, Walden University, 2017

BSN, Jacksonville State University, 2013

Dissertation Submitted in Partial Fulfillment
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Abstract

This study involved determining why mothers hesitate to vaccinate their children and where they get their information about vaccinations. This descriptive qualitative study guided by the health belief model explored the influence social media has on mothers' perceived barriers to vaccinating their children. A descriptive qualitative approach was used, and one-on-one audio interviews were conducted via Zoom or in person with 19 participants. Participants were mothers 19 or older, had children between zero and 18, made medical decisions for their children who resided in their household, and sought information about vaccinations via healthcare providers, social media platforms, friends, or family. Participants were recruited using Facebook, the Walden University participant pool website, and a women's support meeting at a local hospital. Interviews were conducted until saturation was reached, and then the interviews were transcribed and analyzed using Colaizzi's seven-step process for analysis. Results revealed six themes: source of information, trust in healthcare providers, vaccine safety, side effects, adequate information, and recommended CDC vaccination schedule. The study results can lead to social change by educating the public about the benefits of using selected social media sites based on evidence-based research findings when making vaccine decisions. Further studies are needed to determine which websites have factual information supported by research. Improving healthcare providers' knowledge about determining whether the information available to mothers is evidence-based may result in a larger immunized population from common childhood illnesses.

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Dedication

This dissertation is dedicated to my family, for none of this would have been possible without their love and support. Words cannot express what you all mean to me!

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I cannot express enough thanks to my committee for their continued support and encouragement: Dr. Mary Martin, my committee chair, and Dr. Donna Bailey, my committee member. I sincerely appreciate the guidance, support, and learning opportunities you provided. I could not have done this without you.

To Dr. Leslie Hussey, thank you for your continued support and guidance. You pushed me when I thought there was no way I could finish. You are a true blessing to the Walden community.

To my caring, loving family and friends who put up with my craziness, stress-filled days and nights, the tears, and the celebrations. You were all with me 100% of the way and would not let me quit, even when the road to the finish line was not in sight. I love you all very much.

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Chapter 1: Introduction to the Study

Many factors influence mothers' decision-making when considering vaccinations for their children. Vaccinations have potential side effects and risks but many disease prevention benefits. It is vital to protect classmates, family members, and communities. Vaccines help build the immune system by producing antibodies against disease. According to the Centers for Disease Control (CDC, 2021b), diseases that can be prevented with a vaccine reduce costly doctor visits, hospitalizations, and premature deaths.

Patients often turn to social media for advice, and the healthcare community recognizes its relevance to modern society (Stones & Smith, 2018). Mothers may turn to social media to decide whether to vaccinate their children. They often begin weighing the risks and benefits of vaccination during pregnancy, and as a result, many new moms are hesitant to vaccinate (Glanz et al., 2017). They may seek numerous sources and even express interest in receiving information about vaccinations before delivery by visiting social media sites that disseminate misinformation. More than 40% of patients use social media for health-related information, and 90% of patients between 18 and 24 use social media and believe health information found in social media to be true and accurate compared to people between 45 and 54 (Surani et al., 2017). Thapa et al. (2021) categorized internet use into three categories: direct, indirect, and none. Thapa et al. (2021) stated that 24.9% of health information is sought from family and friends. Direct internet users exhibited more significant levels of preparedness and a higher likelihood of posing additional questions to their healthcare providers.

Social media can be a resource if healthcare professionals discuss and validate information. According to Wright et al. (2019), social media is a prominent source of information that can affect beliefs and behaviors. Adoption of these beliefs spreads further and faster in online communities. Healthcare staff (nurses, physicians, and case managers) lack awareness of mothers' information-seeking behaviors, creating potential barriers and disconnects between patients and providers. According to Kolff et al. (2018), negative parental perceptions of vaccines require engaging healthcare professionals to build fact-based and well-informed discussions on vaccine content between themselves and their mothers. Open dialogue can be initiated to ensure mothers make informed decisions regarding their children's vaccinations.

Successful strategies are needed to address mothers' vaccine hesitancy. According to Daley et al. (2018), parental vaccine hesitancy is a concern in the United States and globally. Developing strategies to reduce vaccine hesitancy is a challenging task that is complex and constantly evolving. This study involved determining why mothers hesitate to vaccinate their children and where they get information about vaccinations. The study will impact vaccine-hesitant mothers by empowering decisions with evidence-based information.

Chapter 1 includes the background, problem statement, purpose, theoretical framework, definitions of terms, research question, nature of the study, assumptions, limitations, delimitations, and significance of the study.

Background

The World Health Organization (WHO, n.d.) stated that vaccine programs prevent two to three million deaths worldwide. The Centers for Disease Control (CDC, 2022) reported that vaccines prevent four million deaths worldwide yearly. According to the CDC (2021b), the percentage of children who are vaccinated by 24 months broken down by vaccine is as follows: 93.7% for diphtheria, tetanus, and pertussis (DTaP), 92.6% for polio, 90.8% for measles, mumps, and rubella (MMR), 90.6% for hepatitis B (Hep B), 90.2% for varicella (chickenpox), 79.6% for Haemophilus influenza type B (Hib), 81.0% for pneumococcal conjugate vaccine (PCV), and 68.3% for the combined seven-vaccine series. Dubé et al. (2021) stated that the WHO identified refusal to vaccinate, despite the availability of vaccines, as one of the ten threats to global health in 2019. Vaccine hesitancy is shared and reported by 90% of countries worldwide (Dubé et al., 2021). Globally, vaccine hesitancy results from religious barriers, culture, gender, socioeconomic factors, and lack of knowledge (Lane et al., 2018). Anti-vaccination messages comprise a large portion of content on popular social media sites (Wilson & Wiysonge, 2020). There is a need to take action to remove antivaccination content from social media platforms. To do this, coordinated efforts against sources of disinformation are necessary.

Most recently, vaccine-hesitant parents were faced with deciding whether to vaccinate their children against COVID-19. According to Miraglia del Giudice et al. (2022), since December 2019, COVID-19 has affected 308 million people, with 22 million (17%) of cases being children. The National Immunization Program recommended that children ages 5-11 receive the COVID vaccine in two doses 21 days apart. Miraglia del Giudice et al. (2022) reported that 38.8% expressed willingness to vaccinate, 37% were hesitant about the vaccine, and 24.2% refused it for their child. Miraglia del Giudice et al. (2022) concluded that parents' unwillingness to vaccinate their children against COVID-19 was related to fear of adverse side effects. By September 2021, one-fourth of the COVID-19 cases in the United States were among children (Rane et al., 2022).

Social media is rapidly becoming a trusted source for health information and medical decisions (Kington et al., 2021). Mothers of infants trust social media sites more than family members and healthcare professionals (Moon et al., 2019). Reich (2017) indicated that some mothers who reject vaccines encounter negative feedback from family members. The stakes for these mothers are significant, as they are emotionally exhausted and sometimes bullied by friends and family. Moon et al. (2019) determined that mothers need guidance accessing trustworthy and evidence-based health information to make informed decisions, and healthcare providers must be proactive to encourage healthy choices. Glanz et al. (2017) concluded that providing web-based vaccine information with social media applications positively influenced parental vaccine behaviors. Vaccine information promoted on social media can enhance credibility via forming links with other organizations with similar values and goals. When social media is used by health departments, local health services, advocacy groups, and professional associations, vaccine information can be provided to mothers so they can make medical decisions for their children. There is a lack of qualitative findings in the literature about vaccine hesitancy among mothers who use social media as their primary source of information when researching the risks and benefits of vaccinations.

Problem Statement

Vaccinations have been proven to eradicate diseases. However, mothers still choose not to vaccinate their children. Mothers often search for vaccine information on social media instead of contacting their healthcare providers for evidence-based information regarding benefits or adverse effects. Online resources play a significant role in health-related behaviors. One in three adults in the United States goes online to diagnose a medical condition (Melovic et al., 2020). This plays a critical role when mothers vaccinate their children. Online resources also contain misinformation that can persuade mothers not to vaccinate, negatively impacting public health. Vaccinations are the most cost-effective way to prevent infectious diseases. When mothers refuse or delay vaccinations, they increase the risks of social infection (Melovic et al., 2020). Mistrust of vaccinations was one of the ten threats to world health in 2019 (Melovic et al., 2020). Mistrust of vaccinations is primarily fueled by social media's influence, creating situations where mothers question whether traditional information sources are trustworthy. Many mothers make these decisions based on what they read from social media groups without verifying information (Suarez-Lledo & Alvarez-Galvez, 2021). I investigated why mothers hesitate to vaccinate their children and explored where they get their information to decide whether to vaccinate. I focused on the trustworthiness of sources to determine if informed decisions can be made about the vaccine. Once it is known where mothers are getting their information, healthcare providers can make pointed efforts to share science-backed information on said platforms, enabling mothers to make their own well-informed decisions.

To improve patient outcomes, there is a need to fill the theory and practice gap regarding relevant and timely education among mothers and healthcare staff. By supporting them, based on the literature, they can make informed decisions for their children about whether or not to be vaccinated. McNeil et al. (2019) state that vaccination decisions are complex, and many factors impact decisions. There is a need to find new ways to take feelings of pressure and parental commitment off mothers so they can make informed decisions.

Purpose of Study

This descriptive qualitative analysis study explored social media's influence on mothers when deciding to vaccinate their children. The purpose of this study, guided by the health belief model (HBM), was to explore mothers' perceived barriers to vaccinating their children. I gathered and analyzed data using interviews.

Research Question

RQ: What influence does social media have on mothers' perceived barriers to vaccinating their children?

Theoretical Framework

I used the HBM to guide my study. Rosenstock originally proposed the HBM in 1966 to understand health behaviors. In 1988, the HBM was revised by Rosenstock, Strecher, and Becker to fully explain the relationships between resource availability, health status, and relative risk of vaccines (Guidry et al., 2020). The HBM has two components: the desire to avoid illness and the belief that a specific action will prevent or cure any disease or condition. The six HBM constructs are perceived susceptibility, severity, benefits, barriers, cue to action, and self-efficacy of health-related behaviors (LaMorte, 2019).

Perceived susceptibility is a person's subjective perception of the risk of acquiring an illness. Perceived susceptibility can involve a person's vulnerability or an illness or disease. Perceived severity is the person's fear of contracting a severe illness, including medical and social consequences. Perceived benefits are how a person views the effectiveness of their actions to reduce the threat of disease. How a person reacts to prevent the illness depends on evaluating and considering the benefits of avoiding the disease. Perceived barriers are how a person feels about performing a recommended health action. Perceived barriers can lead to cost analysis of the action. A cue to action is needed to trigger the decision-making process of a recommended health action. Cues can include advice from others or physical ailments such as chest pain. Self-efficacy refers to the confidence to perform a behavior successfully. It relates to whether a person completes the desired behavior.

The HBM guided the study to explore the influence of social media on mothers' decisions about vaccinating their children and understand the reasons for delaying or refusing vaccinations. I applied the HBM to mothers' perceived barriers, individual beliefs about vaccinations, lived experiences, and perceived benefits of vaccinating versus not vaccinating. More information about the HBM is presented in Chapter 2.

Nature of the Study

Qualitative research is used to understand the meaning of how individuals understand social or human problems (Creswell & Creswell, 2018). Praveena and Sasikumar (2021) used Colaizzi's descriptive data analysis method to articulate the straightforward description and perceptions of participants' experiences. My primary goal was to understand the influence social media has on mothers when making decisions about vaccinations. My research was structured using interactions with mothers in Facebook groups and interviews. Descriptive analysis is best used to answer questions about people's lived experiences and gain insights into actions and motivations behind a decision. Through Colaizzi's descriptive data analysis method, phrases or sentences were extracted from interviews that directly pertained to the investigated phenomena (Zheng et al., 2023). Descriptive qualitative analysis describes how human beings experience a specific phenomenon. In phenomenological research, the researcher produces detailed interpretations of participants' lived experiences. I derived data from in-depth solo interviews using open-ended questions.

Definitions

The following terms are used frequently throughout and defined here to promote clarity:

Adverse event: A health problem that may occur after a vaccine or shot. An adverse event may be caused by a vaccine or not (CDC, 2021b). It can include both common side effects and severe reactions. Side effects caused by vaccines are usually minor, such as pain/redness at the site or low-grade fever, and go away independently.

Anti-vaxxers: Individuals who are active in their efforts to oppose widespread vaccination to fulfill social goals. Anti-vaxxers resist evidence-based medicine and vaccine information (Motta et al., 2021).

Cues to Action: The concept that an action can be triggered by perceived susceptibility and perceived benefits (Glanz et al., 2008).

Immunity: Protection from a disease (CDC, 2021a).

Immunization: The process by which a person becomes protected against a disease through vaccination (CDC, 2021a).

Perceived Barriers: A person’s feelings about performing a recommended health action by weighing the movement’s effectiveness against side effects, pain caused by the action, or inconvenience the action may cause.

Perceived Benefits: According to Carico et al. (2021), perceived benefits are what individuals expect to gain from engaging in behaviors.

Perceived Severity: Feelings about the seriousness of contracting an illness or the severity of consequences if left untreated (Glanz et al., 2008).

Self-efficacy: A person’s conviction to successfully carry out behaviors required to produce results (Glanz et al., 2018).

Social Media: A computer-based technology that allows people to share their thoughts, ideas, and information through virtual networks and communities. Social media is used to quickly exchange content such as personal information, documents, videos, and photos via computers, tablets, and smartphones (Dollarhide, 2021).

Vaccine: A substance used to stimulate antibody production and provide immunity against one or more diseases, prepared from the disease's causative agent, its products, or a synthetic substitute, and treated to act as an antigen without inducing the disease (CDC, 2021b).

Vaccination: Administering a vaccine to a person to produce immunity to a disease (CDC, 2021c).

Vaccine Hesitancy: Delay in vaccine acceptance despite the availability of vaccine services (Lane et al., 2018). Vaccine hesitancy is situational and complex and varies with time, place, and vaccine. Convenience, confidence, and complacency are all factors that influence hesitancy (Lane et al., 2018).

Assumptions

In this study, I assumed that mothers thinking about immunizing their children wanted to find the most up-to-date information possible. Another assumption was that participants honestly explained why they refused, postponed, or permitted vaccinations for their children. Participants were urged to be honest about how they felt about vaccinations. Assumptions can influence inferences that can be made from data.

Scope and Delimitations

I used a descriptive qualitative approach. The population for the study was mothers of children between 0 and 18 who had been vaccinated, not vaccinated, or delayed vaccination. Women who were currently pregnant were not excluded if they had another child between 0 and 18. To recruit for the study, I used a convenience sample from social media platforms by generating a pool of participants who refuse, delay, and vaccinate their children. The first point of contact for recruiting was Facebook groups whose participants were mothers of children between 0 and 18. Study criteria were chosen based on experience working as a neonatal intensive care unit/nursery registered nurse and seeing mothers not making informed decisions about vaccinations firsthand.

I used a qualitative approach to explore the influence of social media on mothers' medical decision-making regarding vaccinating their children. I excluded mothers with children older than 18 and expectant mothers who did not have another child. I considered other approaches for this study, such as grounded theory and ethnography. Grounded theory involves addressing what questions and theories emerge from data. This method is used to theorize why people act as they do. Ethnography was not chosen as this involves exploring complex cultural norms through long-term engagement. Neither of these approaches was appropriate as I looked at beliefs and perceptions of why or why not to vaccinate. Blogs, Facebook, Instagram, Twitter (now known as X), YouTube, and Pinterest, are the most influential social media platforms on this topic.

The theoretical framework for this study was the HBM. The desire to avoid illness and the belief that an action will prevent or cure any disease are the two primary constructs of the HBM. The HBM examined participants’ thought processes and decision-making regarding vaccinating their children. It helps predict whether people will willingly change their health behaviors based on health perceptions (Sulat et al., 2020). The HBM was used to examine individual thought processes and healthcare decision-making.

I considered using Albert Bandura's social cognitive theory (SCT). This social learning theory explains human behavior via a three-way model wherein personal factors, environmental influences, and behavior constantly interact (Beauchamp et al., 2019). The SCT can be applied to disease prevention and management interventions because the basic premise is that people learn through their own experiences and observing the actions of others. I did not use SCT for my study because of its limitations, as it does not involve emotion or motivation and can be broad in scope.

The findings of my study will help fill the research gap statement by qualitatively exploring the role social media plays in mothers' decisions regarding whether or not to vaccinate their children. This study will provide information, knowledge, and insights that will help mothers make evidence-based decisions about vaccinations for their children and assist healthcare professionals in determining the most effective approaches for providing vaccination information to mothers.

Limitations

The study's potential limitations included gaining access to social media and support groups due to some participants' strong feelings against healthcare workers and lack of willingness to participate. This study had limitations due to a small sample size, unavailability of resources, and a flawed methodology. I studied in the southern United States by visiting support groups for mothers. There was difficulty in gaining access to the groups. Another limitation was gaining access to Facebook groups or other social media platforms. I posted enrollment criteria to Facebook.

Transferability of qualitative study results is problematic to predict (Schloemer & Schroder-Back, 2018). I showed transferability by providing information about descriptive data, the setting, sample size, sample strategy, demographics, and inclusion and exclusion criteria.

Significance

The results of this study may lead to new findings regarding mothers' perceptions of social media and their decisions to vaccinate their children. This study may provide healthcare staff with increased knowledge regarding this topic. Removing barriers is the most significant action providers can take to improve compliance regarding vaccination of children (Bragazzi, 2019). Providing mothers with correct information about the side effects of vaccines removes barriers, but education has not worked so far. These findings may provide new information about how damaging social media reinforces obstacles to compliance. This is imperative information when healthcare providers become aware that removing barriers is essential to changing decisions for parents. Building a rapport with mothers who are nonjudgmental, based on mothers' decisions about vaccinations, can lead to positive social change. Human interactions and relationships that transform cultural and social institutions define social change (Dunfey, 2019). Listening to each other, even if one group has a different point of view, is the first step toward social change. To make an actual change, the first step is to listen, and the second is to respect and not stop at acceptance but have conversations that lead to points of agreement. My findings included new information about how and whether social media causes mothers to refuse or delay vaccinations for their children. This study can lead to positive social change by explaining how social media can be optimistic regarding the decision to vaccinate if this decision is researched using reliable sources. Understanding why mothers turn to social media when deciding to vaccinate may lead to open communications between mothers and healthcare staff and a better understanding of why mothers choose not to vaccinate (Bradshaw et al., 2021). My findings may provide new information about how damaging social media reinforces barriers to compliance.

Vulnerable populations are at the most significant risk for illness and death, as remediating unsafe and unhealthy conditions has become a global health concern. One way to counteract these unsafe and unhealthy conditions is to give mothers evidence-based information to help them conclude that vaccinating their children is beneficial. This research will affect positive social change by fostering research and critical thinking.

Summary

Further research is needed to investigate mothers' decisions about vaccination by removing barriers to compliance using the HBM to improve their opinions on vaccinating their children. Vaccinations have been proven to eradicate diseases, yet mothers still choose not to vaccinate their children. In Chapter 1, I provided an overview of why mothers turn to social media for guidance on vaccinating their children and how the HBM applied to the study to understand this topic.

In Chapter 2, I present an in-depth review of the literature exploring types of vaccines and vaccine-preventable diseases, why mothers hesitate to give vaccines, how social media and anti-vaxxers influence mothers' decision-making, and how healthcare provider communication can be improved to talk to mothers about vaccinations. This chapter includes information about contributions to current literature.

Chapter 2: Literature Review

Vaccines help build the immune system by producing antibodies against the disease. According to the CDC (n.d.), diseases that can be prevented with vaccines cut down on costly doctor’s visits, hospitalizations, and premature deaths. According to Stones and Smith (2018), patients turn to social media for advice, and the healthcare community recognizes social media platforms’ relevance to modern society.

Mothers may turn to social media to decide about their children’s vaccinations. According to Glanz et al. (2017), mothers often hesitate to vaccinate their children and begin to consider risks and benefits during pregnancy. They may seek many sources and express interest in receiving information about vaccinations before delivery by visiting social media sites that may disseminate misinformation. More than 40% of patients use social media for health-related material, and 90% of patients between 18 and 24 use social media and believe health information on social media is true and accurate (Surani et al., 2017). Wright et al. (2019) concluded that an opportunity exists to develop patient education regarding best practices when using social media information.

Social media groups, chatrooms, and pages that discuss vaccinations can be excellent resources for mothers if the information is discussed and validated with healthcare professionals. According to Wright et al. (2019), social media is a prominent source of information and can affect beliefs and behaviors. Wright et al. (2019) stated that these beliefs and behaviors spread quickly through online communities.

However, healthcare staff (including nurses, physicians, and case managers) lack awareness of these information-seeking behaviors, creating potential barriers between patients and providers. Mothers’ willingness to discuss social media findings with providers can improve patient-provider interactions (Wright et al., 2019). According to Kolff et al. (2018), the influence of negative parental perceptions of vaccines produces a need to engage healthcare professionals to build fact-based and well-informed discussions about vaccine content for mothers. Open dialogues can be initiated to ensure mothers make informed decisions regarding their children’s vaccinations. They can quickly find multiple viewpoints reaffirming their prior beliefs (Moon et al., 2019; Steffens et al., 2019). Steffens (2019) claimed that misinformation is persuasive and increases public fear, lowering vaccine acceptability and vaccination rates. Some websites present factual information, while others deliberately give inaccurate information. Mothers must sift through vast amounts of information, message boards, and blogs that discuss vaccine-related topics. Further examination is needed to explore evidence influencing decision-making, levels of collaboration between providers and patients, and patient education regarding best practices to implement informed decisions about vaccinations.

To address the gap in the literature regarding how social media influences mothers’ decision-making about immunizations for their children, I examine who contributes to social media sites. Communication regarding anti-vaccination on social media often demonstrates to be more effective than pro-vaccination language in terms of influencing mothers’ opinions because anti-vaccination communication is commonly emotion-centric (Ward & Budarick, 2021). Emotionality plays a significant factor in decision-making. I was interested in how social media affects mothers’ emotions when vaccinating their children. I also wanted to explore if mothers researched information they received on social media to ensure it was from a credible site before deciding. Outside influence on perceived susceptibility regarding adverse outcomes impacts personal beliefs and leads to individual intentions. Cues to action include seeking preventative healthcare such as vaccinations (Mercadante & Law, 2021).

In Chapter 2, I review the literature on how social media influences mothers' decision-making when vaccinating their children, vaccine-preventable diseases, vaccine hesitancy, and how healthcare communication can help them make informed decisions. This chapter begins with an overview of literature search strategies and the study's theoretical foundation. The literature review follows. The chapter concludes with a summary of critical points and transitions to Chapter 3.

Literature Search Strategy

I performed a literature search for studies on social media's influence on mothers regarding medical decision-making for vaccinations. I used the following search engines: Google Scholar, MEDLINE with Full Text, Academic Search Complete, CINAHL Plus with Full Text, and Science Direct. Search terms were *vaccine*, *vaccinations*, *immunizations*, *hesitancy*, *refusal*, *decline*, *mother*, *social media*, *anti-vaxxer*, and *social networking*. Articles were chosen that were published between 2017 and 2023. Key terms were searched by combining different terms. Some information that was pertinent to the study was published prior to 2017. These articles provided information that added to current research. A literature search was conducted on peer-reviewed scholarly journals, nonresearch articles, and federal government sources published between 2017 and 2023.

Theoretical Foundation

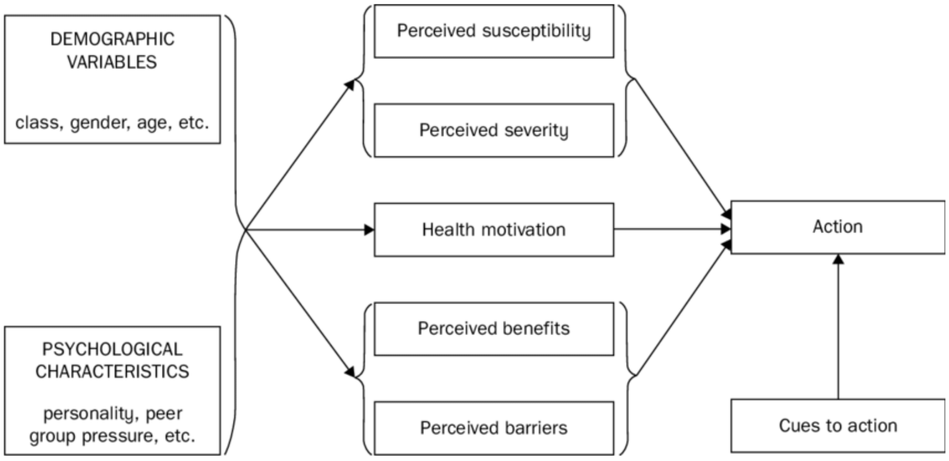
The theoretical framework defines concepts and theories to guide research, relate concepts, and make logical connections (Varpio et al., 2019). The theoretical framework for this study was the HBM.

HBM

The HBM was developed in the 1950s by social psychologists Hochbaum and Rosenstock and later expanded by Becker to understand why people did not use disease prevention or screening tests for early disease detection. The six constructs that predict health behavior—risk susceptibility, risk severity, benefits to action, obstacles to action, self-efficacy, and cues to action—were added by Becker to the HBM. The HBM has two components: the desire to avoid illness and the belief that a specific action will prevent or cure any illness.

Figure 1

HBM



Note. The Health Belief Model. From *Predicting health behaviour: Research and practice with social cognition model*, (2nd ed, p.31), by C. Abraham, & P. Sheeran, 2015, Open University Press.

Theoretical Propositions

The HBM first had four constructs developed with the original theory: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (LaMorte, 2019). As the HBM evolved, cues to action and self-efficacy of the health-related behavior were added (LaMorte, 2019). Perceived susceptibility is the subjective perception of acquiring a disease or condition. Individuals with a low perception may not seek health preventives such as vaccines. Individuals with high perceptions seek preventative care, such as vaccines, for their children (Luquis & Kensinger, 2018).

The second construct of the HBM is the perceived severity. Perceived severity refers to how an individual is more likely to take appropriate action if the perceived threat of the disease is severe (Carico et al., 2021). The adverse outcomes are regarded as what the individual could reasonably experience in perceived susceptibility. For example, suppose the mother thinks the disease is severe enough. In that case, she is more likely to have her child vaccinated against the disease.

The third construct of the HBM is the perceived benefits of action. Perceived benefits are the expectation of advocated health behaviors in the risk or seriousness of health problems (Sulat et al., 2018). For example, mothers with perceived vulnerability and severity may not accept recommendations for vaccinating their children regardless of their perception. Still, they must be confident that the recommended behavior will provide tremendous and favorable benefits.

The fourth construct is perceived barriers. Perceived barriers are the negative aspects of health behaviors that can act as obstacles (Sulat et al., 2018). For example, barriers could include financial difficulties, pain or discomfort, religious beliefs, and inconvenience. Champion and Skinner (2008) found that of the six constructs of the HBM, perceived barriers are the most potent single predictor across studies. Perceived benefits and perceived susceptibility were also significant, but perceived susceptibility was the stronger predictor of preventative behavior (Champion & Skinner, 2008). Champion and Skinner found that several vital principles guide the development of HBM measurement. To ensure content validity, a full range of factors that may influence the behavior of mothers making decisions about vaccinations for their children will be explored.

Application of Theory in Previous Studies

The HBM was used to assess predictors of how a COVID-19 vaccine would be perceived for public availability (Wong et al., 2020). Researchers applied the constructs of the HBM to tailor interventions to enhance vaccine acceptance. Participants in the study had high perceptions of susceptibility, increased perceptions of the severity of the disease, and high perceptions of the vaccine’s benefits. The perceptive barriers were concerns about affordability. In a study by Guidry et al. (2020), the HBM was applied by analyzing Twitter (now known as X) posts about the influenza virus. The study found that high barriers to flu vaccine uptake increased significantly from early to peak season, including an increase in the mention of conspiracy theories. Low threat perception, low vaccine efficacy, risky side effects, and lack of health insurance were barriers to vaccination (Guidry et al., 2020). In early flu season, Guidry et al. (2020) found that 64.5% of tweets on Twitter (now known as X) mentioned the HBM construct of perceived high benefits of the flu vaccine, while 11.3% cited perceived high barriers; 54.7 percent of peak flu season tweets mentioned the vaccine's benefits, while 25.3% mentioned its barriers. Variables included perceived benefits and risks of flu vaccination (including adverse effects) (Guidry et al., 2020). More recently, the HBM constructs were applied to COVID-19 hesitancy. According to Limbu et al. (2022), perceived barriers and perceived benefits were the most common HBM constructs associated with vaccine hesitancy with COVID-19. The absence of perceived barriers, high perceived benefits, self-efficacy, and an individual's agreement with recommendations from authorities, friends, or family (cues to action) was negatively associated with vaccine hesitancy. The results suggest that the HBM can help predict and understand the facilitators and barriers to vaccine reluctance (Limbu et al., 2022). According to Houlden et al. (2021), vaccine hesitancy can be partly due to misinformation that skews perceptions of an illness like COVID-19's severity and susceptibility or the benefits and accessibility of vaccines. The HBM suggests that misinformation is itself a threat to the general public. Mothers' choices vary from time, place, and vaccine type. Immunization is a cost-effective, successful health intervention. Internationally, parental vaccine hesitancy is rising, posing a challenge for health professionals.

Crescitelli et al. (2019) applied the HBM and found 27 studies with 1,557 hesitant parents. The main overarching categories were risk conceptualization, mistrust of vaccine-related institutions, pharmaceutical companies, researchers, health professionals, and media, parental alternative health beliefs about childhood immunity, vaccine schedules, vaccine toxicity, and the parents' information levels about vaccination. Providers must consider that parents want what is best for their children. Health professionals can improve communication and behavior by understanding hesitancy (Crescitelli et al., 2019).

Limbu et al. (2022) examined the influence of HBM constructs on COVID-19 vaccine hesitancy using the Health Belief Model (HBM). The study showed that 33.34% percent of COVID-19 vaccine recipients were hesitant about the vaccine. Perceived barriers and perceived benefits were most often associated with vaccine hesitancy. While perceived benefits were inversely correlated with vaccine hesitancy, perceived barriers were positively correlated.

Thousands of Australians are hospitalized yearly due to influenza; only 40% of adults get the annual flu shot. Trent et al. (2021) surveyed Australian adults to provide population-specific data on influenza vaccination predictors and barriers. The health belief model and online surveys found that individual predictors of self-reported vaccination believed the vaccine was effective and remembered their doctor recommending it. Participants reported that belief the vaccine could cause influenza was a common barrier to vaccination as participants thought the vaccine could make you sick and preferred "natural" immunity. Although 2019 vaccine uptake appears higher than in previous years, perceived barriers may limit uptake among Australians. Tailored interventions are needed to combat widespread flu vaccine hesitancy, especially among high-risk groups.

Rationale for Selection of Theory and Relation of Theory to Study

Understanding and predicting health behaviors can be complex. The HBM theory can help predict health behaviors because people will willingly change their health behaviors based on their health perceptions (Boskey, 2022). The HBM focuses on the individual's thought process, affecting their healthcare decision-making. I will examine how social media influences mothers' decisions about vaccinating their children. Carico et al. (2021) conducted a study to explain how a pharmacist can use the constructs of the HBM as a communication tool to move patients toward behaviors that limit the spread of COVID-19. Carico et al. (2021) suggested that community pharmacists consider the patient's perspective on COVID-19, modify communication accordingly, and address perceived susceptibility, perceived severity, and perceived threat by educating their patients on the health risks associated with COVID-19 as they are trusted members of the community. Carico et al. (2021) suggested that community pharmacists address perceived benefits by encouraging patients to stay at home and social distancing. Pharmacists should address perceived barriers by working with the patient and reassuring concerned patients. The community pharmacist can address perceived self-efficacy with patients by working with the individual with mail-order refills, drive-thru service, and other no-contact methods.

The mother's perception of their children's susceptibility to vaccines and the side effects can risk their children's health. The HBM could assist healthcare providers in discussing a mother's decision to vaccinate, the reason behind their decision, and where they received their information. Understanding the application of the HBM is critical to assisting the mother in separating fact from fiction when deciding whether or not to give their children vaccinations. The four significant constructs of the HBM are perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Sulat et al., 2018). Perceived efficacy and cues to actions were added later. The HBM will determine which perceptions are most influenced by social media (Glanz et al., 2008). A mother's perceived susceptibility could come into play as she weighs the likelihood that her children will contract a disease or condition (Glanz et al., 2008). The mother may look at perceived severity as if she does not have her children vaccinated, the consequences of death, disability, and pain (Glanz et al., 2008). The third construct of the HBM is perceived benefits, which is the opposite of perceived severity (Glanz et al., 2008). A mother will look at the benefits of allowing her children to be vaccinated. The potential perceived barrier a mother may face is weighing the potential cost against the expected benefits (Glanz et al., 2008). According to Glanz et al. (2008), self-efficacy is the beliefs that influence feelings, choices, and motivations. A mother applies self-efficacy to vaccinating her children because she believes she is making the correct decisions (Tatsiopoulou et al., 2022). The HBM relates to my study because the HBM is a study of life experiences, perceived barriers, and perceived benefits (Patton, 2020).

Literature Review Related to Key Variables and Concepts

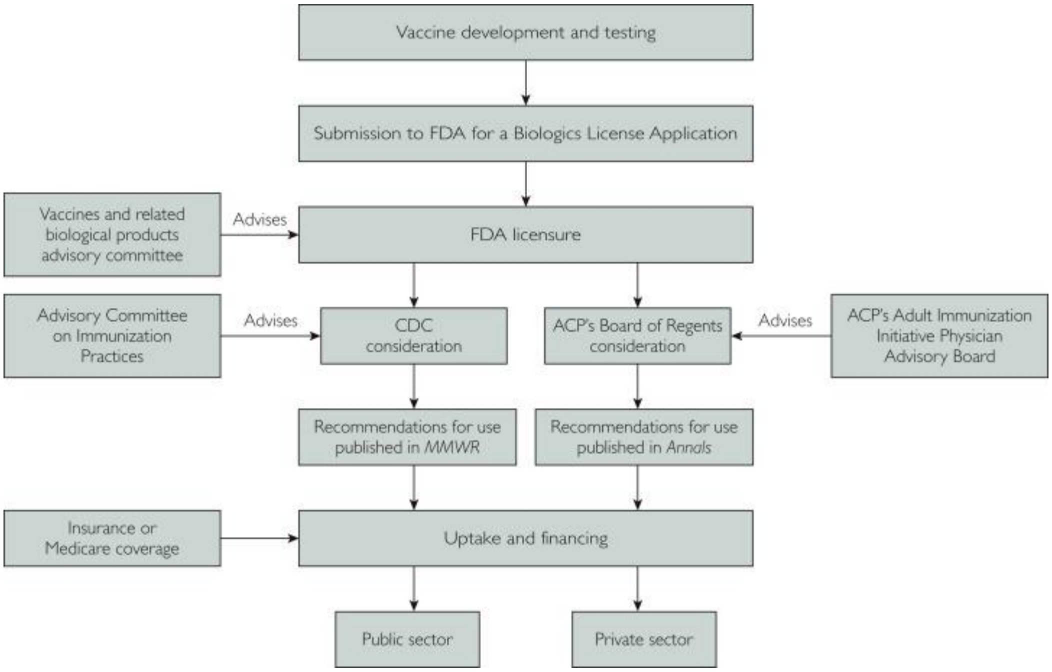
The data in the literature review will help me understand the current information related to the research topic and present a literature synthesis that reveals the need for the study.

Vaccines

An infectious disease caused by pathogens is one of the challenges that humans have faced for centuries. Pezzotti et al. (2018) concluded that universal vaccination programs are the most effective prevention tool against infectious diseases and can decrease mortality and morbidity. In contrast, Liang et al. (2018) and Pickering et al. (2020) agreed that with recommendations from the Center for Disease Control (CDC), the Advisory Committee on Immunization Practices (ACIP), and the Center for Biologics Evaluation and Research (housed in the Federal Drug Administration), we can improve the prevention and immune response of vaccine treatable diseases. The licensure process includes prescribing information that describes indications and populations in which the vaccine is safe and effective based on clinical trials (Pickering et al., 2020). The CDC improves current prevention and control strategies, whereas the ACIP approves vaccines covered under the Vaccines for Children Program. Figure 2 illustrates the development and dissemination of policies and vaccine recommendations.

Figure 2

Development and Dissemination of Vaccine Recommendations and Policies



Note. Development and dissemination of vaccine recommendations and policies. ACP = American College of Physicians; *Annals* = *Annals of Internal Medicine*; CDC = Centers for Disease Control and Prevention; FDA = Food and Drug Administration; *MMWR = Morbidity and Mortality Weekly Report.*
From *Ann Intern Med*. Copyright © 2019 American College of Physicians.
(Smith et al., 2009)

The World Health Organization (WHO) reported declining mortality and disease complications when vaccines were introduced. Diseases such as diphtheria, polio, measles, tetanus, and rubella have virtually been eliminated through vaccination (CDC, 2021b, April 6). Vaccine use in medical interventions has prevented two to three million deaths per year (WHO, 2019). Vaccines have been proven to prevent illness, disability, and death from infectious diseases (Pickering et al., 2020). Vaccines were first developed by Jenner in 1796 with the discovery that milkmaids who had contracted vaccinia (cowpox) were immune to smallpox (Pickering et al., 2020). Jenner injects vesicular fluid from cowpox lesions into the susceptible skin to induce protection against smallpox (Pickering et al., 2020). The method of immunization can be passive and active. Passive immunizations temporarily protect against a specific disease (Pickering et al., 2020). Active immunizations stimulate the body's immune system and produce antibodies against the disease (Pickering et al., 2020).

Compliance with a vaccine is defined as the number of children who receive each dose during the age-appropriate window, and under-vaccination refers to the delay in a vaccine beyond the recommended age (Liang et al., 2018). Undervaccinating can leave children unprotected and vulnerable.

VPDs

Healthy People 2020 (n.d.) states that reducing infectious diseases directly results from immunizations. Since the beginning of vaccine programs, vaccine-preventable diseases (VPD) have dropped dramatically. However, every year, 300 children die from diseases that could have been prevented (Kubin, 2019).

In 1962, the Vaccination Assistance Act (Section 317 of the Public Health Service Act) was introduced to quickly protect preschool children through intensive immunizations. The CDC was given control to support mass, intensive vaccination campaigns that established a mechanism to include financial support to state and local health departments. The initiation of Section 317 only recommended diphtheria and tetanus toxoids and pertussis (DTP), polio, and smallpox vaccine for children. In 1963 and 1966, the measles vaccine was added to eradicate measles. Measles outbreaks were reduced dramatically; however, the disease was not eradicated (Hinman et al., 2011). The mumps vaccine was added in 1967, and rubella was added in 1969. In 1971, the three vaccines were combined to make a vaccine of MMR (measles, mumps, and rubella). Hinman et al. (2011) reviewed reports of epidemic-assistance investigations and published and unpublished reports regarding the history of the CDC's involvement in vaccine-preventable disease prevention. It was not until 1977 that the CDC introduced a Childhood Immunization Initiative with two goals: establishing a permanent system to provide immunization services to children and attaining immunization levels of 90% by October 1979 (Hinman et al., 2011). Funding was increased for Section 317, allowing vaccination for those in need and reviewing vaccination records of school children. In two years, more than 28 million records were reviewed by state and local public health personnel who enacted and enforced school immunization requirements. All 50 states had laws in place by 1980, and immunization levels of students entering school have been ≥ 95% since 1981 (Hinman et al., 2011). Hinman et al. (2011) concluded that Epidemic Intelligence Service Officers (EISOs) have played a critical role in the epidemiology of vaccine-preventable diseases by developing immunization policies and establishing effective means for assessing adverse events after vaccination. EISOs will influence people's willingness to accept vaccinations for themselves and their children.

In 1961, children received vaccines to prevent five diseases: diphtheria, tetanus, pertussis, poliomyelitis, and smallpox. Today, children receive vaccines to prevent 16 diseases: diphtheria; *Haemophilus influenza* type b, hepatitis A, hepatitis B, and human papillomavirus infections; influenza, measles, meningococcal disease, mumps, pertussis, pneumococcal disease, poliomyelitis, rotavirus infections, Rubella, tetanus, and varicella (Hindman & Schuchat, 2011).

A mother's refusal to vaccinate her child or under-vaccinate affects individual immunity and community protection through herd immunity. Herd immunity is achieved when a high percentage of the community is immune to disease through vaccination or prior illness (CDC, 2020d). The ability to effectively develop antibody responses in herd immunity and exposure time between wild viruses and immunizations cannot be altered (Kubin, 2019).

Vaccine Hesitancy

The World Health Organization (WHO) defines vaccine hesitancy as delaying acceptance or refusal of vaccines despite availability (McClure et al., 2017). McClure et al. (2017) reviewed literature from 1999 to 2017 that focused on vaccine hesitancy and refusal. McClure et al. (2017) determined that evidence-based communication strategies to address vaccine hesitancy are needed at the community level. It is estimated that 0.8% of children ages 19-35 months are not vaccinated, 10-20% of parents report refusing or delaying one or more vaccines, and even more parents report vaccine concerns (Daley et al., 2018). Vaccine hesitancy is a spectrum of parental beliefs and concerns. Vaccine hesitancy can refer to the delay in acceptance or the refusal of vaccines despite availability. False information on vaccines has been highly publicized and has received public backlash. Vaccine hesitancy started when Dr. Andrew Wakefield published an article in 1998 in *The Lancet* claiming that the MMR (measles, Mumps, Rubella) vaccine caused autism (Lynøe & Eriksson, 2019). Although the article was retracted, and researchers have disproved the link between autism and vaccines, parents still believe vaccinations cause autism (Lynøe & Eriksson, 2019).

Vaccine-hesitant parents may refuse some vaccines, agree with all the others, delay doses, or accept them while unsure of submitting their children to vaccinations (Bianco et al., 2019). Bianco et al. (2019) investigated parents’ opinions and attitudes regarding childhood vaccinations, Wong et al. (2020) studied the problem of rumors and conspiracy theories, and Lane et al. (2018) investigated the leading causes of vaccine reluctance. All three agreed that a counterapproach to vaccine hesitancy should utilize communication and trust building through the healthcare practitioner, improving public awareness and perceptions. Bianco et al. (2019) reported that 24.6% of parents admitted to delaying or refusing to give their children at least one dose of a vaccine. Over half of the study's parents felt it safer to administer three or fewer immunizations simultaneously. One-third of parents reported that their children experienced an adverse reaction after vaccination. Parents claim vaccine skepticism is related to pharmaceutical companies’ lucrative business practices (Bennett, 2019). According to Bianco et al. (2019), 12% of parents made their vaccination decision after learning information from the media, while 62% of parents obtained information from sources other than their pediatrician. Social media is a source of knowledge about vaccines; however, it can also be risky and encourage vaccine hesitancy.

According to Lane et al. (2018), vaccine hesitancy is the only component of vaccine demand included in the Global Vaccine Action Plan developed by the World Health Organization Strategic Advisory Group of Experts (SAGE). The Global Vaccine

Action Plan developed a vaccine hesitancy definition and determinants matrix. The matrix defined two indicators: reasons for vaccine hesitancy and the percentage of countries that have assessed vaccine hesitancy at the national or subnational level in the last five years (Lane et al., 2018). The statistics for reasons for vaccine hesitancy have increased each year by 5% since 2014 and, as of June 30th, 2017, were at 78%. Evidence from the three-year review (2004-07) indicates that the WHO determinants matrix of vaccine hesitancy helps classify causes for vaccine reluctance because more than 95% of the explanations fit into the matrix. The demand for vaccinations should include ongoing community engagement and trust building, regular national assessment of vaccine concerns, hesitancy prevention, and crisis response planning (Lane et al., 2018).

Social Media Influence

Social media influence plays a significant role in vaccinations and mothers' decisions about vaccinating their children (Moon et al., 2019). The internet is a growing source of information at the fingertips of anyone who chooses to access it. This is especially true regarding health information. In the United States, 59% of adults seek online health information (Moon et al., 2019). Researchers Moon et al. (2019), Daley et al. (2018), Wawrzuta et al. (2021), and Glanz et al. (2017) investigated how parents perceived the benefits and drawbacks of social media as a source of health information. Everyone concurred that the online parental-focused immunization resources open to the public were poor quality. These studies also concluded that social media should be watched to disprove the misinformation spread by websites opposed to vaccinations. As women tend to their families, the Internet offers advice and assistance. According to research, mothers make most of the family and children-related decisions. Because they have questions, mothers are also more likely to turn to online resources like social media for advice (Moon et al., 2019). In addition, mothers believe that social media information is more reliable than friends and relatives (Moon et al., 2019).

The techniques, viewpoints, and experiences of communicators working with social media groups that promote vaccination were all examined by Steffens et al. (2019), Cuesta-Cambra et al. (2019), and Shoup et al. (2018). These investigations concluded that social media's potential influence harms immunizations. Shoup et al. (2018) and Steffens et al. (2019) advise combining scientific evidence, boosting vaccination promotion, and building trusting relationships with organizations with similar values and objectives. According to Cuesta-Cambra et al. (2019), primary preventive programs, health education campaigns, and other communication and public health-related initiatives will all be beneficial for reducing vaccination hesitancy in the future. Large health systems, governmental organizations, and professional associations might also be used, according to Shoup et al. (2018), to adopt expert-moderated social media platforms for parent vaccine conversations. Parents can gather accurate vaccine information, express concerns, and ask questions on these platforms. When mothers access this vaccination misinformation, they believe it is accurate and choose not to vaccinate their children. Misinformation can be persuasive, popular, and spread with ease. Once the misinformation is on social media, correcting it is not easy. This misinformation increases public fear, and mothers lose confidence in the vaccine. Social media influence can lower vaccine acceptability and vaccination rates, leading to disease outbreak clusters (Steffens et al., 2019).

Social media platforms such as Facebook and Twitter (now known as X) influence the sharing of health information and consumer-to-consumer information. Modanloo et al. (2019) found 65 online resources in the website and video format that were parent-targeted vaccination resources. Guess et al. (2020) reported that 84% of Americans visit a vaccine-related webpage yearly. YouTube is also popular among parents and has been used since 2005 for health education dissemination (Modanloo et al., 2019). Online information can improve health behavior and empower healthcare decision-making and self-care by increasing the understanding of medical conditions (Modanloo et al., 2019). However, mothers of infants and children seeking information about vaccinations will find thousands of discussion forums, websites, and video forums that can overwhelm and confuse mothers (Modanloo et al., 2019). Both studies agreed that further studies should focus on developing effective strategies to foster vaccine uptake and promote evidence-based health literacy. Modanloo et al. (2019) reported that social media platforms are sources of information for parents about vaccinations; however, only 5% of the social media platforms met the CDC rating for quality information.

The internet can be an essential source of vaccine information for concerned mothers. Eller et al. (2019) examined how much mothers trust in their child’s healthcare provider versus alternative sources, whereas McClure et al. (2017) analyzed how healthcare providers should communicate with vaccine hesitant mothers. These studies together confirmed that further interventions backed by evidence-based communication to reduce vaccine hesitancy should be considered to build or improve the mother's trust in the healthcare provider.

Anti-Vaccination Websites

The definition of an anti-vaxxer is an individual who opposes vaccinations, is serious about protecting their refusal to vaccinate, and may use various means to keep their child unvaccinated (Smith & Graham, 2019). Most of the communication between anti-vaxxers takes place on the internet and social media platforms. Anti-vax websites are highly prevalent online and have more influence than pro-vaccination websites (Smith & Graham, 2019). Elkin et al. (2020) and Smith and Graham (2019) examined the anti-vaccination movement on social media. Both studies concluded that more research is necessary because anti-vaccination websites have a highly gendered network structure and a strong sense of moral outrage related to vaccination practices. Both studies discovered that anti-vaccination communities increase their internet visibility despite algorithm and regulatory modifications. Elkin et al. (2020) also found that Facebook publishes more unfavorable material than YouTube. These websites encourage naturally protective mothers to research vaccine-related medical information online. When moms visit these websites searching for information about vaccinations, they find persuasive anti-vaccination content that is not supported by any evidence. These websites will probably feature accounts of people who have experienced childhood illness and death, alleging that vaccination was the cause without providing additional medical information (Smith & Graham, 2019).

The standard mission of anti-vaccination groups is to promote people’s rights to be fully informed about pharmaceutical products’ quality, composition, and short and long-term effects (Evrony & Caplan, 2017). Another mission of anti-vax groups is to educate mothers regarding the dangers of vaccinations and lobby for increased vaccine exemptions. Anti-vaccination groups make many claims against vaccines. One claim is that vaccines cause cancer, autoimmune diseases, seizures, and peanut allergies (Evrony & Caplan, 2017). Another claim is that vaccines contain aluminum, which is a neurotoxin. Aluminum is included in some vaccines; however, an infant will only receive a small amount, about 4 milligrams, in the first year of life (Evrony & Caplan, 2017). What anti-vax websites do not tell mothers is that an infant can ingest 7 milligrams of aluminum while breastfeeding, and adults ingest 7-9 milligrams per day (Evrony & Caplan, 2017).

Bradshaw et al. (2021) examined how anti-vaccine supporters in a closed Facebook community interacted with and affected first-time new mothers. According to Bradshaw et al. (2021), the difference between closed and open or public groups is the key to comprehending social impact. Closed groups give the impression of having more privacy, and lengthy discussions have been demonstrated to be more insightful and illuminating of the decision-making process surrounding vaccination than those held on public pages.

While Wong et al. (2020) investigated anti-vaccination rumors and conspiracy theories, Wawrzuta et al. (2021) acquired and evaluated information connected to knowledge about antivaccination social media users. Both analyses found that the anti-vaccine movement only used a small number of justifications in its statements. Changing public views and expertise should be utilized as a countermeasure to anti-vaccination websites, according to Wong et al. (2020), while Wawrzuta et al. (2021) found that it is feasible to create publications that dispel misconceptions and refute assertions made on anti-vaccination websites.

Individuals can freely post on anti-vax websites and are encouraged to share vaccine injury stories. Mothers share pictures of before and after photos to show altered physical abilities. However, posters are not required to prove that the vaccine affected the child (Evrony & Caplan, 2017).

Healthcare Communication

Evidence suggests that vaccine information delivered by healthcare providers can impact and improve vaccine uptake (Karras et al., 2019). The way healthcare providers approach communication can negatively impact the acceptance of immunizations. Karras et al. (2019) researched the current online dialogue-based intervention to support vaccination conversations. Karras et al. (2019), Berry et al. (2019), McGee and Suh (2019), and Kauffman et al. (2019) all researched dialogue and communication tools to support healthcare providers when discussing vaccinations with mothers. Karras et al. (2019) concluded that a central repository or website would assist healthcare providers with improved comprehension and different communication interventions available. Berry et al. (2018) and Kauffman et al. (2019) developed practical communication tools to support healthcare providers with mothers who are hesitant about vaccinating their children. Both studies concluded that communication tools or websites offer different interventions to address vaccinations, vaccine hesitancy, and vaccine refusals with mothers.

McGee and Suh (2019). Reno et al. (2018) and McClure et al. (2019) explored successful communication strategies to address vaccine hesitancy in healthcare settings and on social media. Both studies determined that presumptive communication instead of participatory style was more effective when communicating with vaccine-hesitant mothers, as a presumptive style has been shown to increase vaccine acceptance. McClure et al. (2017) and Reno et al. (2018) introduced motivational interviewing (MI) to strengthen healthcare provider communication with vaccine hesitant mothers. Reno et al. (2018) concluded that healthcare providers have three issues discussing vaccinations with mothers: lack of time, low self-efficacy, and psychological resistance. Motivational interviewing improved self-efficacy in the providers' ability to communicate with hesitant mothers. However, conversations between providers and mothers still need to be researched. McClure et al. (2017) concluded that electronic communication interventions such as text messaging and social media have emerged as effective methods of communication and may become more critical in the coming years.

Mothers want to participate in the decision-making about vaccinating their children and be able to access more information about immunizations than is currently available. Healthcare providers are viewed as trusted and credible sources of information (Berry et al., 2018). When healthcare providers persistently engaged with mothers on vaccines during an office visit, 47% who had initially refused vaccines changed their minds (McGee & Suh, 2019). Communication between the healthcare provider and the mother can be categorized into two stages: introducing the need for vaccines and discussing concerns about vaccines (McGee & Suh, 2019).

McGee and Suh (2019) described the best practice techniques to address vaccine hesitancy using the Corroborate, About Me, Science, Explain (CASE) model. Perspectives from the primary pediatric provider and parent vaccine advocate addressing vaccine hesitancy on social media were examined. The researchers concluded that actively creating networks and inviting participation from those outside the healthcare provider and scientific communities is crucial for addressing vaccine hesitancy and the long-term attitudes of vaccine-hesitant individuals.

Effective communication with mothers is essential for maintaining and generating demand for vaccines. Strategies for communicating with mothers are to operate at an interpersonal level while delivering information differently (Kaufman et al., 2019). Communication includes face-to-face interactions, mail/email, print, radio, television, and community events. Communication should be evidence-based but not complex. Appropriate communication can reduce decisional conflict and increase knowledge (Kaufman et al., 2019)

Mothers who decline or change their minds about vaccinations attribute their decision based on the behavior of their healthcare provider (Kaufman et al., 2019). Healthcare providers are in an excellent position to address vaccine hesitancy by using time with mothers to build rapport and trust. Healthcare providers can also support emotional and cognitive aspects of decision-making and address the factors that may fuel mothers’ distrust (Berry et al., 2018).

Mothers' Decision-Making

According to Corben and Leask (2018), mothers decide whether to vaccinate during the prenatal period. Mothers who refuse or delay vaccines are twice as likely to report they made the decision prenatally and eight times more likely to re-evaluate the decision after birth (Corben & Leask, 2018). Corben and Leask (2018) determined that further research is needed on how to talk with mothers about vaccinating their children, mainly focusing on timing, content, and delivery style. McDonald et al. (2019) explored whether mothers homeschool their children to avoid vaccination. Homeschooling is an area that is not well studied. The researchers categorized the mothers into three groups: confident and accepting, hesitant and welcoming, and skeptical and refusing. All the mothers reported that making their children receive vaccinations infringed on parental rights. The first group, confident and accepting, believed vaccines were safe and effective. The second group, hesitant and accepting, expressed varying confidence levels that vaccines were safe and effective. The last group, skeptical and refusing mothers, believed vaccinations were unsafe and ineffective. All three groups of mothers reported that vaccine safety and effectiveness were underlying factors in vaccine decision-making. McDonald et al. (2019) reported that the factors influencing their decision to accept, delay, or refuse vaccinations were the importance of conducting research, weighing the risks and benefits, advice from medical professionals, and subjective safety statements about the vaccine. McDonald et al. (2019) concluded that further studies should measure vaccine hesitancy and refusal.

In a study by Baumann et al. (2019), researchers explored the sources of information and value factors during decision-making among mothers deciding to have their daughters vaccinated against HPV (human papillomavirus). The study determined that mothers are considered the primary healthcare decision-makers in the family. The researchers found evidence that the mother's decision was influenced by her beliefs, interactions with clinicians and family members, and media exposure. The study concluded that healthcare decision-making is only achieved with sufficient coverage and herd immunity, and efforts are made to ensure mothers can make well-informed and unbiased decisions.

Although several studies have shown how social media affects mothers' perceptions of barriers to immunizing their children, there is little information on why mothers turn to social media for information instead of asking their doctors for advice. Therefore, there is a need to study mothers' hesitancy and barriers to vaccinating their children and determine why mothers refuse, delay, or hesitate when vaccinating their children.

Summary and Conclusions

Collaborative efforts between mothers and healthcare providers are needed to increase community demand, vaccination access, and interventions to increase vaccination rates (Jacobson et al., 2020). While building rapport and trust, healthcare providers should focus on culturally and context-appropriate material with mothers. What is known in the literature is that social media influences mothers' decision-making when vaccinating their children. However, the literature does not show what information mothers receive from social media. Misinformation on social media platforms leads them to decisions that are not evidence-based. These websites increase fear of vaccinations, which lowers vaccine acceptability and rates, leaving children at risk. My qualitative study will help fill the gap in understanding the influence and impact of perceived social media barriers on mothers deciding whether to vaccinate their children.

In Chapter 3, I present the research design and rationale, my role as the researcher, the methodology, and the study's trustworthiness.

Chapter 3: Research Method

This study, guided by the HBM, explored social media’s influence on mothers’ perceived barriers to vaccinating their children. I present a detailed description of the research design and rationale, as well as my role and methodology, including instrumentation. I will address procedures for recruiting participants, data collection, and analysis. I conclude the chapter by validating the study's trustworthiness and ethical guidelines.

Research Design and Rationale

I used IPA to analyze data and answer the following research question: What influence does social media have on mothers’ lived experiences regarding decisions about vaccinating their children? I applied the constructs of HBM to address this topic. Mothers’ reasons for vaccine hesitancy are complex and context-specific.

I conducted semi-structured interviews using an interview guide (see Appendix A) to collect data. Semi-structured interviews explored participants’ thoughts, beliefs, and feelings, collected data from open-ended questions, and approached personal and sensitive issues. I asked participants what social media platform they used, what advice they sought, and what information they received about vaccinations. I also wanted to explore advice received from other mothers, family members, or social media sites by discussing it with their healthcare providers or researching evidence-based websites or journals. I expanded on open-ended questions to explore this topic. I used the HBM to interview participants about their lived experiences. The HBM comprises six concepts:

perceived benefits, perceived susceptibility, perceived severity, perceived barriers, cues to action, and self-efficacy, which I used to guide my research.

Role of the Researcher

I developed and implemented a research plan that aligns with the study problem, purpose, research question, and approach. I devised an interview guide (see Appendix A) with appropriate qualitative terminology consistent with the study's objective, questions, and strategy. Lastly, I determined the study's data collection and management approaches to address this topic. There were no conflicts of interest during the study. Recruiting through my professional network consisted of speaking at support groups offered to mothers I did not know. My only potential relationship was with the nurse who led the support group. I did not know the participants prior to attending the support group. If participants had a professional or personal relationship with me, I ensured they understood that declining the interview did not affect our personal or professional relationship. Any association of a supervisory nature did not exist.

During the study, I was aware of potential ethical issues. I did not focus on a sensitive or vulnerable population; all participants were over 19. I minimized stress risks by being mindful of participants' decision-making and vaccination beliefs. I conducted interviews face-to-face, via video calls, and through multimedia platforms with participants. All interviews were recorded, transcribed, and reviewed for accuracy.

Researchers influence the research process by interacting and building relationships with participants in data collection. The research process and findings must remain transparent while showing empathy and impartiality. By showing compassion, researchers build trusting relationships without invoking emotional distress. As the researcher, I avoided personal beliefs, biases, and values during data collection to remain nonjudgmental and nondirective by being self-aware and reflective about my role in collecting, analyzing, and interpreting data. My reflective notes were used to achieve this throughout the interviewing process.

Methodology

Participant Selection Logic

I gathered data from mothers who were 19 and over and were influenced by social media when vaccinating their children. I posted an invitation on social media groups (blogs, Facebook, Instagram, Twitter (now known as X), YouTube, and Pinterest) and in-person support groups using a specifically worded flyer (see Appendix D) and letter of recruitment (see Appendix E). I used purposeful sampling to select participants who could best answer the research question and enhance their understanding of the topic.

This study involved the following sampling strategies. First, criterion-based selection was used to produce participants with shared experiences and information-rich cases that align with my research question based on specific characteristics. Next, snowball sampling increased the sample size by asking participants to refer to other participants.

Sample Size and Saturation

The sample size is sufficient when no new concepts can be determined (Saunders & Townsend, 2018). Patton (2020) recommended a sample size of five to 25 participants.

Once data saturation was met, I stopped recruiting participants. Descriptive analysis was used to determine the best course of action, understand why trends occur, and inform predictions about those trends (Cote, 2021). Screening questions (see Appendix B) were used to determine if participants met the selection criteria.

Instrumentation

Interviewing participants using an interview guide is the most direct data collection method to gather detailed information. Interviews for this study consisted of structured questions (see Appendix A) for open-ended questions to explore and shape conversations. Through structured interviews, I invited participants to relay their experiences regarding immunizations for their children. I introduced core elements of the study to ensure data were captured and allowed participants the flexibility to bring their perspectives and personalities to discussions. Semi-structured interviews allowed for questions to be asked and answered with follow-up questions to ensure detailed descriptions were generated. Prompts depended on the questions and conversations between the participants and me. I used a published data instrument with permission and adapted the instrument to align with my study’s problem, purpose, research question, design, and methodology.

Sufficiency of Data Collection Instrument

Using open-ended interview questions will capture data to explain why mothers hesitate, refuse, or delay vaccinations. The semi-structured interviews and reflective field notes will be used to understand how social media influences the mother’s decision-making process. Subjective data from the participants' lived experiences will help answer how mothers are influenced to make decisions when vaccinating their children.

Research-Developed Instruments

To investigate, I used an interview guide (see Appendix A). An interview guide is a list of issues or questions that will be explored during the data-gathering phase of the study. The guide provides topics the interviewer will be free to explore and ask questions to illuminate the subject (Patton, 2015). The benefit of an interview guide is that questions are carefully decided for the best use of time. An interview guide also makes interviewing several different people more systematic and comprehensive. Interview guides allow for questions to be asked in the same order to all interviewed. The guide provides a framework to develop questions, sequence those questions, and then decide which questions to pursue in greater detail based on the respondents’ answers (Patton, 2015). Just as the HBM explains achieving optimal behavioral changes, an interview guide can explore the lived moments by capturing personal descriptions of the lived experience by describing the phenomenon in concrete terms. To establish content validity, the data will be compared to the results of other relevant data in the literature to ensure the evaluation of all aspects of the behavior in the research design has been measured. It does not create bias (Almanasreh et al., 2019). I will conduct 1 or 2 interviews with a test group of participants to ensure clarity, capture additional questions, and identify questions. As the interview process continues, adjustments will be made to clarify and understand questions. If a question is cumbersome to a participant, I will re-write the question for clarity.

Procedures for Recruitment, Participation, and Data Collection

I will contact individuals through social media posts (Facebook) and open forum parenting groups by posting an invitation flyer (Appendix D). My flyer will be posted on the Walden University Participant Pool if permission is granted. I will also attend local mom support groups (breastfeeding groups, birthing classes) once permitted to introduce the study and ask for participants. A signed letter of cooperation will be obtained so that I can speak at any support groups. I will post my invitation flyer (Appendix D) at local pediatricians and obstetrician offices where the target audiences can be reached. If permission is granted to post my flyer, a letter of cooperation will not be needed as approval is applied to allow me to post my flyer. Suppose I should get an interested candidate from these locations who wishes to participate in my study. In that case, I will not name the organization in my published reports or presentations. If they choose to participate, my contact information is on the invitation flyer. A gift card will be offered as a thank-you to participants who complete the study. If the individual is interested in participating, they will email me to indicate their interest to arrange an interview. Once the participant emails me showing interest, I will send the participant the consent form and inclusion criteria. This will allow the participants to complete the initial survey when they consent. If the participant wants to participate, they will reply with “I consent,” and an interview will be scheduled. Interviews will be conducted in person or via video conferencing. The participants will have decided that they meet the criteria for the study. After submitting the reply email, I will arrange an interview time and place online via (zoom) or in person. Interviews will be conducted via video chat or in person, depending on the participant's preference and location. In-person interviews will be held in a public location that would offer sufficient privacy (i.e., a private room at the library, hotel conference room, private community center room, rented office space, etc.). If the participant wishes to conduct the interview online, the meeting will be in a room with no other individuals present.

During the interview, I will verify the inclusion criteria (Appendix B) and ask each participant the demographic questions from Appendix C. After completing the demographics form, I will begin the interview.

I will interview each participant in person, via an online video conferencing system, or in-person (depending on the participant’s preference) and audio record each interview to allow for verbatim transcription and subsequent data analysis. Each interview will be no longer than one hour. When conducting interviews, I will remember the time needed, account for all elements, make introductions, ask the interview questions, and make closing remarks. Interview questions will be asked to encourage the volunteer to elaborate on their experience (Appendix A).

Member checking will be done during the interview by building rapport with the participant to obtain honest and open responses. During the interview, I restate or summarize information and then question the participant for accuracy. Once the study has been completed, the participants will exit the study with an email that will include the name of the study, my contact information, a personal thank-you gift, and a reiteration of the purpose of the research. I will not include a debrief form as I do not wish to burden my participants more.

All data will be stored in a password-locked file on a password-locked computer. I will keep the data for five years and then destroy it to comply with Walden University's policy.

Recruitment will occur until analysis indicates an adequate saturation has been obtained. According to Guest et al. (2020), saturation occurs when data analysis occurs when incoming data produces no new helpful information relative to the study objectives. Saturation consists of base size, run length, and new information threshold. The base size of saturation is the minimum number of data collection events to review to calculate the information gained. The run length of saturation is the number of interviews that look for and calculate new information. Thirdly, the new information threshold of saturation is obtained when data collection is $\leq 5\%$. If additional participants are needed, I will follow the same process through social media and local groups to get other participants until the desired numbers are achieved.

According to Klose (2021), there are five steps in recruiting high-quality participants for qualitative studies. I will fine-tune my screener survey questions to select participants quickly. I will also screen for participants who can narrate their vaccination choices and explain their decisions' emotional and logical processes. Participants will also be pre-screened before the interview by answering the screening questions (Appendix B) to determine initial eligibility and interest in the study. All data will be collected by myself and recorded from each face-to-face or video call interview.

Data Analysis Plan

The analytic approach for this study will be content analysis. Content analysis helps summarize and classify verbal and non-verbal data. The analysis will be conducted by developing and applying codes inductively. Inductive coding is a ground-up approach that allows the theory narrative to emerge from the data (Azungah, 2018). According to Rose and Johnson (2020), the reliability of research can be achieved by consistently showing rigor in the study. Trustworthiness requires consistent use of clear themes or codes (Rose & Johnson, 2020).

In step one, data will be categorized by repetitive words or phrases in the interviews, representing a theme or idea and assigning a meaningful title. According to Korstjens and Moser (2017), the three types of codes used are open, axial, and selective. Open coding is the initial coding of raw data. Axial coding will connect and link the categories. Selective coding will formulate the story by joining the categories. Coding will be done using a qualitative data analysis software program, MAXQDA.

I used Colaizzi’s seven-step data analysis method to improve the study results' reliability and dependability (Wirihana et al., 2018). Wirihana et al. (2018) state that Colaizzi’s method aligns with nursing core values as it acknowledges people’s experiences. Colaizzi’s seven steps of data analysis are 1) reading and rereading the transcript; 2) extracting significant statements that pertain to the phenomenon; 3) formulating meanings from those statements in step two; 4) aggregate formulating meanings into theme clusters and theme; 5) develop a description of the phenomenon’s structure or essence; 6) a description of the fundamental structure is generated, and 7) validate the findings of the study through participant feedback to complete the analysis. Implementing these seven steps will be rigorous and used to understand, find, depict, and describe the participants’ experiences as they experience them. Colaizzi’s seven-step method is a clear and logical way for researchers to apply the descriptive analysis approach.

Issues of Trustworthiness

Trustworthiness in a study refers to the research design’s systematic rigor, the researcher’s credibility, the believability of the findings, and how the research method is applicable (Rose & Johnson, 2020). Trustworthiness is critical in maintaining a consensus that qualitative research is credible. To show trustworthiness, researchers incorporate numerous validity techniques throughout the research process. The methods to establish trustworthiness use credibility, dependability, transferability, and confirmability (Kyngäs et al., 2020).

Credibility is considered the central concept of methodologies. Credibility becomes evident when the researcher develops themes coherent with the case’s theoretical foundations, where validity involves the adequacy of the research design and the methods used in each topic (Daniel, 2019). Credibility materializes in the data collection process, the data review, and how the interpretation of the data refers to the questions displayed in the text. The study can be verified by how the data was collected, whether the sample size and responses were sufficient, and whether the research measures what it claims to measure (Sürücü & Maslakci, 2020). I will focus on triangulation and member-checking methods to show credibility in my research.

Triangulation uses multiple techniques, observers, theories, or data sources to fully understand the study (Ravitch & Carl, 2020). Member checking is sharing data interpretations and conclusions with the participants to clarify intentions, correct errors, and provide additional information if needed (Ravitch & Carl, 2020). To show credibility, I will focus on questions such as, “Are my methods aligning with my research question? Do I understand the patterns I see in the data (Ravitch & Carl, 2020)?”

Dependability occurs when another researcher can follow the decision trail used by the researcher. This decision trail is achieved by describing the purpose of the study, discussing how and why the participants were selected, describing how the data were collected, explaining how the data was analyzed, discussing the interpretation of the findings, and explaining the techniques used to determine the credibility of the data (Thomas & Magilvy, 2011). A dependable study is consistent and has had enough observations to show consistency. Dependability occurs when coding checks support concepts and themes—the coding checks show agreement between the study and ideas. Dependability is enhanced when existing theories are tied to new findings (Kyngas et al., 2020). To establish dependability in my research, I will consider how my methods map into my research question, whether my study is rigorous, and what might be challenged about my research design, data collection, and analytic process (Ravitch & Carl, 2020).

Transferability in qualitative research is how findings from one study can be applied to other groups of people or settings (Kyngas et al., 2020). Transferability advocates that those results gained in a particular context can offer value to similar research. Transferability ensures that the context of the interviews, behaviors, and events are typical for the participants (Schmidt & Brown, 2017). To show transferability in my study, I will answer the following questions: Have I clarified the embeddedness and contextual relevance? How will I interpret my data contextually and authentically (Ravitch & Carl, 2020)?

Confirmability is the extent to which others can confirm the researcher's interpretations and conclusions and is established by accurately describing the data and findings (Nassaji, 2020). The confirmability of qualitative research shows that the research is free from bias. To avoid bias in my research, I will reflect on the following questions: Am I inadvertently imposing my agenda, potentially influencing the integrity of my data? At what point should I seek thought partners around issues related to my subjectivity (Ravitch & Carl, 2020)? I will also keep precise and accurate field notes, which will be used in my data analysis.

Ethical Procedures

Before conducting my study, I will seek approval through Walden's Institutional Review Board (IRB). I will gain local permission from in-person sites to be used and their participants by identifying gatekeepers or key personnel. I will select local places that do not have a vested interest in the outcome of my study. I will disclose the purpose of my study and not pressure participation in my research. Any names used in the study will be kept confidential and coded as P1, P2, etc., as will any data obtained from the research. I will ensure all participants receive the same treatment by building trust and avoiding deceiving any participants. I will respect potential power imbalances or exploitation of participants by avoiding leading questions, withholding personal impressions, and avoiding disclosing sensitive information about participants. I will prevent collecting harmful data by sticking to the questions stated in the interview protocol. When analyzing data, I will avoid siding with participants and disclosing only positive results by reporting multiple perspectives and contrary findings. When reporting, sharing, and storing data, I will report honestly and assign codes to replace names so individuals cannot be identified. I will provide a one to two-page summary to participants. I will give credit for ownership to researchers, participants, and advisers. I will store the data from my study for five years.

Summary

In this chapter, I presented the research design and methodology involving structured interviews with mothers who decided on vaccinations for their children. Chapter 3 also described the participants, my role as the researcher, and how data were collected and analyzed. A description of the study’s trustworthiness and related strategies were included. I will report the results in Chapter 4.

Chapter 4: Results

The purpose of this study was to explore the influence of social media on mothers' decision to get vaccinations. To address this topic, I used a descriptive qualitative approach. My goal was to explore the research question: What influence does social media have on mothers’ perceived barriers to making decisions about vaccinating their children? The chapter includes information about data collection, participant demographics, data analysis methods, data reliability, and analysis results and concludes with a summary.

Setting

For this study, I gave participants virtual or in-person interview options, depending on their location. In-person interviews were conducted in private rooms, as agreed upon between the participant and me. To ensure privacy, all discussions occurred in locations where other people could not see or hear conversations. I conducted all interviews in private and locked Zoom rooms where participants had to enter a code so that no other participants could log in. No existing personal or organizational conditions influenced participants or their experiences during the study. After I obtained informed consent (see Appendix F), interviews began. I changed the data collection plan in Chapter 3 to use NVivo because I had trouble using MAXQDA for coding.

Demographics

There were 23 participants for this study, and only 19 could be used for data collection. Of those participants, ten identified as Caucasian. Eight participants identified as African American, and one identified as Brazilian. Participants were all adult mothers between 26 and 51 with an average age of 35 and 6 months. Four participants were in their 20s, nine were in their 30s, five were in their 40s, and one was in her 50s. Sixteen participants reported having a college degree, and three received their high school diploma. Of the 19 participants, 18 stated English as their primary language, and one was multilingual in English and Portuguese. The total number of children of participants in the study was 33, with 13 being male and 20 being female. The average age of children was six and two months for males and five and four months for females.

Data Collection

There were 23 participants recruited for this study, and no participant initiated withdrawal. One person signed up four times with different email addresses and names. I did not find this participant trustworthy as responses to questions, demographic information, and appearance when on camera were too similar. Although the participant used different names and email addresses, participants’ glasses were the same when comparing each video.

Participant recruitment occurred by posting a flyer on the Walden University participant pool and my personal Facebook page (see Appendix D). Additional flyers were distributed at my local hospital's local breastfeeding support group. Potential participants contacted me via email, showing interest in the study. After I made contact, I emailed all participants the study information (see Appendix E), which included the consent form (see Appendix F) and inclusion criteria (see Appendix B). Participants had ample time to review the study’s risks and benefits and keep copies of the consent form and my contact information for questions. Once participants reviewed the data, they responded to my email with the words, “I consent.” Local participants chose between in-person face-to-face interviews or virtual Zoom interviews. Only one participant requested an in-person interview. All other participants were interviewed via Zoom. Dates and times that were convenient for participants were then scheduled.

I collected data from June 1 to July 31, 2023. Interviews were recorded with the permission of each participant and lasted from 20 to 45 minutes. To guide discussions, I used a prepared set of interview questions authorized by the BMJ Publishing Group (see Appendix A). To ensure data quality, I asked probing questions for further discussion when participants had limited responses. Various benefits result from trusting relationships, including improved adherence to health outcomes, better patient experiences, and open information communication (Carico et al., 2021). Following interviews, each audio recording was transcribed verbatim into Microsoft Word documents. Nonverbal cues were added to each transcript to increase the richness of data. After each interview, I thanked participants for their time and offered them their choice of a Target or Starbucks gift card. I also let participants know that I would send a summary of my findings once the study was complete. Interviews and recordings were transcribed and reviewed for accuracy. I uploaded data into NVivo for coding.

Location, Frequency, and Duration of Data Collection

Before I began data collection, my dissertation committee and Walden University’s IRB approved my study and associated tools. The IRB was approved on May 18, 2023. Initial recruitment and data collection began on June 1 and continued through July 30, 2023.

All participants participated in one-on-one interviews with me through Zoom calls or in person. They were asked to reserve at least 45 minutes for interviews and understood they might run over 45 minutes if needed. Dates and times that were convenient for participants were scheduled. All participants who were interviewed via Zoom agreed to be on camera. Participants were encouraged to find private rooms for interviews. During interviews, I did look for nonverbal cues when asking participants about sensitive topics. I was in a private office to maintain privacy and confidentiality. To conduct all Zoom interviews, I provided participants with individual links to a private and secure meeting room.

Each participant was allowed adequate time during interviews to reflect and answer questions. They were encouraged to add information on the topic they deemed necessary. Participants were also encouraged to ask questions. Interviews lasted an average of 23 minutes, ranging from 15 to 35 minutes.

Recording of Data

Each interview was recorded via audio and video. All files were saved to my computer and transcribed verbatim in Word documents. Notes were taken during and immediately following the interviews using reflective journaling. These notes were entered in a Word document and saved on my computer. Participants were assigned a number (e.g., P1, P2, P3) for all recordings, transcripts, and notes. No personal information identifiers were associated with these materials. All materials were stored electronically on a flash drive that is password protected.

Variations in Data Collection

Initially, participant recruitment was done by posting a flyer on Facebook and through Walden's participant pool website. I asked Facebook users to share my post in order to reach a variety of participants. I also was approved to post my study on Walden's participant pool website. This allowed me to have participants outside the state of Alabama. I was also approved to attend a local hospital mothers' support group. All participants contacted me to say that they were interested in participating. I sent an email describing the study along with consent and screening requirements. I then scheduled interviews with those who met the criteria and wished to participate.

All interviews went as planned except for four participants. I had one person sign up four times with a different email address and name. All four participants came from the Wadlen Participant Pool. The similarities to her answers seemed suspicious. The answers to age, number of children, accent, and location were identical. She was able to change her appearance sightly, except for her glasses. I excluded these four interviews from my data collection.

Data Analysis

Data analysis was completed following Colaizzi's seven steps. As recommended by Colaizzi, I read and reread the transcripts, extracted significant statements, formulated meanings from those statements, formulated meanings into theme clusters, and then developed a description from the theme. I completed my data analysis with steps six and seven, describing each theme's fundamental structure and validating the findings through the participant's feedback to compare the analysis. These seven steps allowed me to review the participant's experiences clearly and logically to apply the descriptive analysis approach to the study.

I used Notta to transcribe my audio files and create transcripts to begin data analysis. For accuracy, I added body language, facial expressions, and tone of voice to the transcription. I checked the transcripts several times to ensure objectivity and avoid any bias. The key points discussed included vaccine safety, trust in healthcare providers, reasons for vaccine hesitancy, and the influence of social media. I identified keywords, word frequencies, and phrases that emerged from the data. The selected statements showed significance to the research question and were noted verbatim in the quotes.

Codes and themes were developed from the transcribed data. The text was copied directly from the transcripts and placed into an Excel spreadsheet for each code. Each entry had a code assigned and placed into the column next to the text. If a section had multiple meanings, multiple codes were assigned. However, each code was separated into columns and continued for the interview. Similar codes were grouped into categories. This process allowed me to sort material according to the initial codes (see Table 1).

Table 1

Themes, Codes, and Excerpts

Theme	Code	Excerpts
Main Source of Information	Vaccine Information	P5: “Nine times out of ten, it is asking the pediatrician, or if there’s something else I will do, a quick Google search, but then with that, I’m a little more selective on the websites that I use. I gravitate more towards Cleveland Clinic, Emory, and Mayo, partly because of, with my dad’s heat transplant and stuff like that too. P6 “Probably the Walden Library, actually. Yeah, so scholarly articles and stuff”

Theme	Code	Excerpts
Trust in Healthcare Provider	Vaccine Information	P13: “I usually go to my Mom first because she has a PhD in Nursing. Her knowledge, she is very up to date on the research. And then we also, my son has cystic fibrosis, and so we work with a team of doctors, nurses, nutritionists out here. And so that’s usually my secondary source. And then third is, I’ll go to his pediatrician.”
Safety of Vaccines	Vaccine Information	P17: “I mean, I think I think there of course there are risk. Umm, there are risk, but I think the benefits outweigh the risks so. And then I think the medical side can kind of go. Go too far in the other directions, saying yeah, there’s risks and benefits and your doctor can best advise you”.
Side Effects	Vaccine Safety	P18 “I honestly think, I think it’s the fear mongering that you see on social media. I mean, we have access to all kinds of information, whether it’s accurate or not. And I feel like it does sway people’s opinions. And I feel like a lot of celebrities are very influential in that, you know, someone you think you know and trust because they ‘ve been in your favorite movie gets on social media and you think their well-educated and possibly not. And their saying, well, I’m not vaccinating my kids because it causes autism. Well, people are influenced by that kind of stuff. If it’s on social media, it’s true, right? And then if enough people are saying that and agreeing with it. The majority of people are not going to be misinformed, right? I do worry a little bit about the ingredients that go in that maybe we are not fully aware of. I’m never worried about the actual dead viruses or whatever. I do wonder what it’s mixed with, what kind of things, because there have been, haven’t been some studies that say there has been mercury and things like that.
Adequate Information	Vaccine Safety	P3 “Yeah, I would say it’s adequately out there. I’m trying to think if I’ve ever, other than like in his office, whatever little information he gave me. I don’t think I’ve ever, like when I registered for daycare or registered for kindergarten or evenlike arriving through customs in America, I don’t think anybody ever gave

Theme	Code	Excerpts
		me, like here's what's recommended, You know? I don't know, like a checklist. So, I don't know, I would say, I would say I guess maybe like CDC recommendation or whoever, whichever organization it is, recommendations. Definitely they are available, but not like, I don't know, not something that just like comes at you unless you're seeking it out."
CDC recommended Schedule	Delaying/refusing Vaccines	P2 "Yes, as a matter of fact, my 11-year-olds, I let them get the Tdap at school that they needed to go into 6th grade. I signed the paper instead of having to take them to the doctor. That's the first time I have ever done that, by the way. I just let them do the school one. I love the school nurse so much. Here in [redacted], and I told nurse [redacted], I was like, just let them do it at school. Saving a trip to the pediatrician.

Through descriptive qualitative analysis, I analyzed the data to understand the participants' experiences. The transcripts were carefully reviewed, focusing on the participant's essential claims, which allowed me to interpret the meaning of those claims. I worked to understand the participants' experiences as codes were generated from the data. I worked through the transcribed data, reading and re-reading to annotate for insights into each participant's experiences. After cataloging emerging codes, I saw patterns in the codes of the participants' ideas, thoughts, and feelings regarding vaccinating their children. The main themes from the data were that participants trusted their healthcare professional as their primary source of information, believed vaccines were safe for children, were concerned about the side effects of vaccinations, and followed the CDC's vaccination schedule.

Theme 1: Main Source of Information

During my interviews, most participants (56%) said their healthcare provider as their primary source of vaccine information. Participants received information from various sources, including Google, Facebook, family, and their healthcare provider. I asked participants if they searched for vaccine information before or after talking to their healthcare provider. One participant would ask her mother, who is a registered nurse, regarding vaccines. “My mom has a PhD in nursing. Her knowledge, she is very up to date on the research. And then we also, my son has cystic fibrosis and so we work with a team of doctors, nurses, nutritionists”. The participant stated she would ask her mom first, her child’s healthcare team, and then would discuss with the pediatrician. One participant discussed finding information on TikTok that would spark an interest. After reviewing the information on TikTok, the participant would talk to her child’s healthcare provider.

Theme 2: Trust in Healthcare Professionals

The key components of the patient-healthcare provider relationship is trust and confidence. There are various benefits that come from a trusting relationship, including improved adherence of health outcomes, better patient experience, and open communication of information. According to Basnight (2023), patients trust healthcare providers when the healthcare providers show they are thinking of the patient first and hears the patients concerns. Healthcare providers need to take the time to listen and engage with the patient in order to determine and perform the care plan. Trusting the healthcare provider became a big issue during the 2020 pandemic (Carico et al., 2021).

All participants interviewed during this study said they trusted their healthcare provider when vaccinating their children. When asking P6 about discussing vaccines with her healthcare professional, she stated

> part of the reason with my family is because my dad with his transplant. So we have to be sure the fact that all this stuff is, yeah, cause there's some vaccines with my dad's transplant that if it's a live vaccine. I think he's not supposed to be around him, first, a period afterwards, because it can be transmitted to him.

P6 discussed her child's vaccines with her healthcare professional in-depth, as some vaccines are live and some are inactivated. She wanted to protect her child but also needed to protect her extended family.

Theme 3: Vaccine Safety

Vaccine safety played a significant role with all participants. All the participants felt vaccines were safe for children. A few hesitated to give their child the COVID-19 vaccine because there was little research on the side effects. These participants discussed with their healthcare provider how to weigh the risks and benefits and decide whether their child should receive it. Even though the participants felt the vaccines were safe, eight (47%) were concerned about side effects. I asked the participants if they were concerned that the vaccine given to their child early in life would still be effective later in life if exposed to the disease. The participants were split. Seven participants had concerns that their child would not be covered if exposed, and ten participants felt their child would be protected. I probed further into this question by categorizing vaccinations into the “tried and true” (meaning the vaccines that have been around for numerous years) against the new vaccines such as COVID-19 and HPV. The participants were concerned about the side effects and ingredients of the newer vaccines.

Theme 4: Side Effects of Vaccines

The side effects of vaccinations were of great concern to the participants. When I asked one participant if she had concerns about vaccine side effects, she stated

> I have concerns because you hear sometimes just from social media, even though it is not information that you can rely on, but you hear that maybe it can cause infertility in the future and all that kind of like you get worried even though it’s information that is not has not been proven yet, but it warrants it.

When probed further, I asked the participant if she thought there was adequate information out there for you to make an informed decision about vaccinations? The participant stated, “I think there is not enough because there are still doubts, especially for young parents. So, I think it should be out there more. And there should be awareness created about vaccination and the importance”. P14, whose child is currently being followed by a neurologist, was worried about the side effects of vaccinations and that it may cause autism. The participant stated, “the main thing for me would really be autism. From the research that I have done, in my opinion, there is a questionable issue regarding how it affects children”. Participants stated that the fear of side effects was a concern. One participant stated.

> I do worry a little bit about the ingredients that go in that maybe we're not fully aware of. I'm never worried about the actual dead viruses or whatever. I do wonder what it's mixed with, what kind of things, because there has been, haven't been some studies that say there has been mercury and things like that.

Looking at the statistics of the participants, eight (47%) stated they did have concerns about the side effects.

Theme 5: Adequate Information About Vaccines

Many participants, 13 out of 17 (76%), agreed that there was adequate information about vaccines, whether it be social media or the healthcare provider. One participant stated when asked if she thought there was adequate information out there, "I think so, but I think that especially on social media, the accurate information gets out. The louder voices are the inaccurate. There's more noise about how facts, it's more sensationalism". Often more than not, the voices out there in social media cause fear mongering, especially to new parents. The voices that are the loudest seem to have the biggest impact, whether they are celebrities claiming that vaccines cause autism or a presidential candidate who is "one of the leading voices of the anti-vaccine movement" whose work is described by public health experts as "misleading and dangerous" (AP press, 2023).

Theme 6: CDC Recommendation Schedule

Out of the participants who were asked, four admitted to delaying vaccinations. When asked why a vaccine was delayed, one participant stated that the vaccine was delayed due to a “recommendation from the doctor”. The participant explained that the healthcare professional allowed them to delay an immunization because of her child’s illness the previous week. A third participant stated, “I haven’t been consistent with the flu (influenza) vaccine for my son”. However, the reason for refusing the influenza vaccine was that “he is so afraid of needles and the meltdowns and the, the point where it’s, it’s not worth it.” All participants, except one, followed the CDC’s vaccination schedule, even though they had delayed some their child’s vaccinations. I interviewed one participant who delayed her child’s vaccination because she had an adverse reaction as a child to the TDP (now known as the Tdap, aka tetanus, diphtheria, and acellular pertussis). Whole-cell pertussis was developed in 1914, combined with tetanus and diphtheria toxoids in the 1940s, and in the 1990s, acellular pertussis was introduced and gradually replaced whole-cell pertussis (Kuchar et al., 2016). According to Decker and Edwards (2021), acute encephalopathy, identified as Dravet Syndrome, has broadened the understanding of encephalopathy after vaccination. The Institute of Medicine (IOM) determined that DTP could cause anaphylaxis, prolonged or inconsolable crying, and febrile seizures and was consistent with acute encephalopathy.

Discrepant Data

During my interview process, I had one participant that I interviewed four different times. Each time, the participant contacted me through a different Gmail account. The first interview with the participant was not on camera. However, when I interviewed the participant the second time, I became suspicious as the answers were too similar to the first interview. The participant emailed me two more times, again from a different Gmail account. I asked the participant to be on camera for the third interview, and the participant agreed. Again, the answers to my questions were very similar. Also, the answers to the inclusion criteria were similar (i.e., same city, state, the same number of children, etc.). I continued with my interview via Zoom. When the fourth interview occurred on camera, the wall color behind the participant was the same, and the participant wore the same eyeglasses the interviewee had before. According to Roehl and Harland (2022), in online research, a participant can easily misrepresent their identities for the chance of financial gain. Because the participant had given me their time, I sent the participant my thank you gift, a gift card from Target. The data from these four interviews were excluded from my research as I could not find them credible.

Evidence of Trustworthiness

Credibility

According to Daniel et al. (2019), credibility establishes that the researchers' findings are dependable, relevant, and congruent, which reflects the researcher's intended reality from the perspectives of the data collected and analyzed. I reflected on the following questions to establish credibility: Do my methods align with my research question? How will I interpret data so that my assumptions and biases are withheld? How can my research design seek complexity? How am I going to connect the data? (Ravitch and Carl, 2020).

To ensure that my methods aligned with my research question, I selected a method of NVivo coding. According to Cooper and Lilyea (2022), NVivo codes consist of a short phrase or word from the actual verbatim transcript of interviews. I chose this method because my research question addresses the participant's realities, such as "exploring the influence of social media on mothers' decision-making about vaccinations." Such an inquiry explores the mother's personal, interpretative meaning within the data. This type of coding establishes an alignment with my study's research question. I assessed code and themes for discrepant data to seek the complexity of the research. To search for disconfirming evidence, I challenged my preconceived notions throughout the generated themes of the study. I wanted my study design to formulate rich data. I also annotated my participants' non-verbal communication, gestures, and tones. I also included various quotes from my interviews with my research participants to ensure that there were multiple contributing data sources. These facets added rich and thick descriptions, and data was interpreted without assumptions or bias.

Transferability

In qualitative research, transferability refers to applying study results to different populations or environments. According to the theory of transferability, findings from one context can be helpful in other contexts. Transferability guarantees that the participants' events, behaviors, and interview situations are typical (Kyngas et al., 2020). Regarding transferability, I considered the following: Am I providing enough contextual data and framing for outsiders to contextualize the study's findings fully? How do I describe the setting, participants, and specifics of the setting? Is there another thick description? Have I clarified the contextual relevance and embeddedness in my analysis and write-up? My study design was created to formulate rich data. Therefore, I annotated nonverbal communication, tones, and gestures in my interviews. I also included various quotes from my participants to show contributing data sources. These factors provided concise and clear procedures while adding thick and rich descriptions and allowed full contextualization of my study’s findings. My goal was to present data that showed my participants' different views. Transferability refers to how easily this work can be used or generalized to different settings. This study focused on a small sample size of mothers, mainly in the southeastern part of the United States. It would be inappropriate to assume that this study could be transferable to other populations because only three ethnicities were represented. The study participants were broken down into ten Caucasians, eight African Americans, and one other ethnicity. However, the study applies to those research strategies for outside influence on the mothers’ vaccination decision-making.

Dependability

Dependability arises from the ability of a different researcher to follow the researcher’s decision-making process. To accomplish this decision trail, the study’s goal is explained, along with how and why the participants were chosen, how the data were obtained, how they were processed, how the results were interpreted, and the methods utilized to assess the data’s reliability. Consistency and enough observations are characteristics of a trustworthy study. Coding checks show agreement in the research and among the ideas and are reliable indicators of support for concepts and themes (Kyngas et al., 2020). By creating my research methodologies, dependability was attained. The rationale for my decision to select a descriptive qualitative analysis over other qualitative methodologies was covered in Chapter 3 of my research study. Reliability shows that results are valid and potentially repeatable. In order to illustrate this, I used audio recordings, annotations of nonverbal communication, and verification of the accuracy of participant transcripts as my data collecting and analytic techniques. These results corroborate the parents' experiences vaccinating their children, strengthening the study's validity. It was impossible to ultimately ensure that the research findings of this study would be consistent because the data showed inconsistent experiences.

Confirmability

The active participation and role of the researcher in the investigation is emphasized in qualitative research. By removing the researcher from the study process, qualitative research aims to achieve impartiality. The active participation and role of the researcher in the investigation is emphasized in qualitative research. By removing the researcher from the study process, qualitative research aims to achieve impartiality. According to Nassaji (2020), confirmability concerns the extent to which others confirm the researcher's interpretation and conclusions. Confirmability can be established by describing the data and the findings so that others can confirm their accuracy. I used a pervasive way to establish confirmability, using an audit trail where I recorded and rationalized all the steps taken and the decisions regarding data coding and analysis. I could look back over my records for further evaluation and confirmation. To further establish confirmability, I reflected on the following questions as a self-check throughout the process: "What is my agenda? Does my agenda influence my research findings? " If my agenda influences the questions, how can I prevent that? Would another researcher come to the same assumptions and interpretations as I did? How can I prevent potential bias? How can I challenge my way of thinking? Furthermore, how can I stay subjective and ensure positionality?

To assure validity, I made notes on each transcript to maintain continuous comparisons of potential bias. I focused on the annotated words in my data to show a true reflection of the participant’s perceptions and not my own. Coding was also a pivotal part of accurately depicting my participant's perspectives. Through coding, I could categorize words and phrases from my interviews to develop themes and assign meaningful titles directly from my participants’ statements. When implementing data collection, I had to keep my agenda in perspective, which was to determine the influence of social media on mothers’ decision-making regarding vaccinations so that I could understand why mothers made the decisions they did. With this awareness, I could ensure that my agenda did not influence my research findings. I listened to my participants with an open mind and made sure not to interject my feelings about my participants. The study findings are only based on my participants’ statements. All data records, including audio files, verbatim transcripts, nonverbal cues, and participant validation of accuracy, will be kept in a password-protected hard drive for at least five years as mandated by the university.

Results

After data collection, an analysis was done following Colaizzi’s seven steps. This resulted in the development of five themes. The key themes that emerged from the results were the primary source of information: participants trusted their healthcare professional, believed vaccines were safe for children, were concerned about the side effects of vaccinations, and followed the CDC’s vaccination schedule. These themes help address the research question, "What influence does social media have on mothers’ perceived barriers in making decisions about vaccinating their children?”

Theme 1

Participants’ primary source of information about vaccines was from their healthcare provider. Participants stated that their healthcare provider supplied adequate vaccine information, and they had confidence in their guidance on vaccinations. Seven of the 19 participants interviewed used social media or the internet to get vaccine information. However, these participants still discussed their concerns with their healthcare provider. Participants searched for vaccination information on social media and websites to answer the research question. However, they did not let the information influence their decision before discussing it with their healthcare provider. P5, who was very selective about dead versus live vaccinations as she did not want to jeopardize the health of another family member, stated:

> Nine times out of 10, it’s asking the pediatrician or if there’s something else I will do, a quick google search, but with that, I’m a little more selective on the websites that I use. I gravitate more towards the Cleveland Clinic, Emory, and Mayo, partly because of, with my [redacted] heart transplant and stuff like that too

This participant’s interview showed that there are trusted sites to research information instead of social media. Social media is not a trusted source of information. During Participant Seven's interview, when asked where she got the most common information about vaccines, she stated, “The most common would be online. That’s going to be everywhere. It’s all over the place”. In further discussion, the participant stated that she did use Facebook groups for information. However, the participant then discussed the information received from social media sites with her pediatrician before deciding. This participant’s interview helped answer the research question as she researched Facebook groups when questioning a vaccine. However, before she made her decision, she would discuss the information received with her pediatrician and make an informed decision.

Theme 2

All 19 participants stated they trusted their healthcare provider when vaccinating their children. Most of the participant's primary source of information was received from their healthcare provider (11/19), and only a few sought advice on other avenues: Google (2), Facebook (2), TikTok (1), Redditt (0), YouTube (0) and social media (1). Participant Eight stated, “We love our pediatrician.” Participant Ten stated, “Yes, I choose to trust them. Okay, okay. Here’s why. I think that, you know, every few, few years we have new breakthroughs in, in, in healthcare is constantly changing as we get more advanced”.

These results exemplify how the healthcare provider is still the primary source of information. However, the internet and social media are easily accessible and at the fingertips of all patients. When interviewing Participant Nine, when asked how she handled adverse reactions or information about vaccines, she stated,

> I usually just ignore it honestly because there’s a lot of information out there. So if I have something that seems questionable, I’m 100%

> just gonna ask my doctor about it because she's gonna have the latest information and the latest studies available.

For a child, the healthcare provider should be the primary source of information when deciding to give or not give a vaccination. These results were outlined in more detail to provide better insight into how participants trusted the advice of their healthcare provider if they had any questions or concerns about a vaccine. Mothers may have perceived barriers regarding vaccinations, but trusting the healthcare provider is the best choice.

Theme 3

The primary concerns about vaccine safety were the participants worried about the side effects, the long-term effects, the ingredients in the vaccine, and concerns that vaccines would cause autism in their child. Most participants felt vaccines were safe for children (17/19), and two had no concerns about vaccine safety. P13, whose child has cystic fibrosis, stated that her concerns were minor. "I mean, sometimes I'll worry about the side effects, just because it's like okay, am I gonna have to manage a fever the next day or next week? But, I really don't have any major concerns about vaccines. I always just want to make sure that they're safe with the medications he's taking."

P17, who reacted to a vaccine as a child, stated she still thought vaccines were safe by stating, "I think there, of course, there are risks. There are risk, but I think the benefits outweigh the risks."

These examples illustrate how mothers have concerns about vaccine safety but still vaccinate their children. The mothers in this study all trusted their healthcare provider to guide them with their child’s vaccines. The participants could discuss any concerns and make an informed decision about vaccinating their children. This data answers the research question by providing more information on mothers' fears about vaccine safety, but weighing the benefits outweighs the risks.

Theme 4

Each participant expressed concerns about vaccine safety. Of the 19 participants, 13 said vaccines were safe for children. The other participants were concerned about the long-term effects, the ingredients in the vaccine, and the possibility of causing autism.

P19, whose child was diagnosed with attention deficit hyperactivity disorder (ADHD) at an early age and is thought to have autism, stated, “he’s been tested. He has ADHD and possibly autism. We haven’t fully tested him for that, but he’s in therapy. I do not think vaccines and autism are related”. P19 discussed how she thought some parents refused vaccines because of fearmongering, as seen on social media. She stated, “Being able to access all kinds of information, whether it is accurate, I feel like it sways people’s opinion.” P19 used the example of influential celebrities that are seen on social media and how they can influence that mom who is on the fence about vaccinations. P19 stated that celebrities come out and say, “I’m not vaccinating my kids because it causes autism. Well, people are influenced by that kind of stuff.”

Vaccines are effective in controlling the spread of and eradicating many infectious diseases. Vaccines undergo a rigorous process through the FDA, with multiple systems in place to ensure the vaccine is safe. As with all medications, there is the risk of side effects and sometimes even adverse effects. The data shows that Mothers discuss the side effects with their healthcare provider to decide if they outweigh the risk of contracting the disease.

Themes 5 & 6

According to the CDC, the use of each vaccine and its schedule is determined by the ACIP’s recommendations after in-depth reviews and related data, including epidemiology and burden of the vaccine-preventable disease, vaccine efficacy, and effectiveness, vaccine safety, quality of evidence, feasibility of program implementation and economic analyzes of immunizations policy (Robinson et al., 2020). Of the 19 participants, 17 stated they followed the CDC’s recommended vaccine schedule. Only two participants stated they were not on the current schedule because of a physician's recommendation or because the child was off schedule because of being ill when the vaccine was due. P3 stated that her child’s vaccines were repeated in the United States to ensure she was covered. At the recommendation of her physician, all vaccines were given as the child was adopted from a rural area of India at 17 months. The physician was concerned about the strength of the vaccines given in India. P3 stated

> she had her India records. And I didn’t even know it was a thing. He was like, so, you know, kids that come from like foreign orphanages or medical facilities or whatever, the vaccinations that they get there can be like, I guess, like a weaker dose it. So, we can trust what India did or we can do them all again.

P3 gave the vaccines again to make sure the child was protected. According to the WHO (n.d.), there is a difference in the vaccination schedules between the United

States and India. Vaccinations are given at different intervals and ages for the two countries. After all vaccines were given at a recommended interval, the child was then on the CDC’s schedule for any new vaccines. P3 also stated, “Her current school vaccination record doesn’t even mention the ones that she got in India.” We discussed that this was a good idea, so that the school does not question why the child received double doses of vaccinations. Again, the data here answered the research question as this participant trusted her healthcare provider to guide her regarding the vaccinations for her child.

The data from the interviews for this study answered the research question, “What influence does social media have on mothers’ perceived barriers in making decisions about vaccinating their children?” through the data collected from the 19 interviews. Mothers do have perceived barriers regarding side effects and safety of vaccinations. However, when concerned about these barriers, they discuss them with their healthcare provider. They have social media at their fingertips, and some participants interviewed did search for information on social media sites. However, all nineteen participants trusted their healthcare provider more than the sites they searched. The interviews in this study demonstrated that mothers' perceived benefits outweigh the perceived barriers when vaccinating their children.

Summary

In this chapter, I outlined results from 19 interviews that were completed. The research question was answered through data from interviews. The themes that emerged from interviews included primary sources of information, trust in healthcare, vaccine safety, side effects of vaccines, adequate information about vaccines, and the CDC’s recommendation schedule. Results showed that participants had various experiences regarding vaccinations. However, social media does not play a significant role in deciding to vaccinate. Theme two showed that participants thought there was adequate information on the internet to make informed decisions. Although vaccine safety and side effects were of concern to participants, instead of going to social media to ask if they should be concerned, they went to healthcare providers to decide. I detailed this chapter's data collection methods, analysis, and study findings. In Chapter 5, I present interpretations of the findings, study limitations, recommendations, implications, and a conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to explore the influence of social media on mothers’ decision-making regarding vaccinations. I sought to understand where mothers get information about vaccinations and make informed decisions. I used the qualitative design during interviews to address extensive opinions and beliefs about vaccinations. This study was conducted to help identify where mothers received their information and whether they discussed decisions with their healthcare providers before deciding not to vaccinate. Nurses and healthcare providers could use results from this study to assist mothers with their decisions, thus keeping their children safe from diseases.

From this study, six main themes were identified: primary source of information, trust in healthcare providers, vaccine safety, side effects of vaccines, adequate information about vaccines, and CDC-recommended schedules for vaccines. Mothers sought information from various places, such as social media, family members, and healthcare providers. Through this study, I conducted interviews with 19 mothers who had children between 0 and 18 who researched information on social media, asked family members or other mothers, or discussed vaccinations with their healthcare providers. This study was accomplished by using a semi-structured interview guide. Although research exhibited that mothers had concerns about vaccine safety and side effects, it also showed that mothers take any information to their healthcare providers for clarification and follow CDC vaccine recommendations.

Interpretation of the Findings

The purpose of this study was to explore the influence of social media on mothers’ decision-making regarding vaccinations. To address the gap in the literature regarding this topic, I conducted a descriptive qualitative study. The descriptive qualitative analysis approach was used to understand mothers' perceived barriers to vaccinations. With an understanding of this topic, healthcare providers can help mothers understand the risks and benefits of making informed vaccination decisions.

In this section, I discuss the study findings in relation to the research question. Interpretations of findings are discussed and grouped by themes identified in this study.

Theme 1: Main Source of Information

This study examined where mothers get information about vaccines. Of the participants, eight stated they got their information from social media; however, the rest received information from their healthcare providers. Wright et al. (2019) stated that beliefs and behaviors can spread quickly through online platforms. Social media should be watched to stop the spread of harmful information as perceived benefits of vaccinations are influenced by social media (Daley et al., 2018; Glanz et al., 2017; Moon et al., 2019; Wawrzuta et al., 2021). Moon et al. (2019) stated that mothers believe social media is more reliable than friends and relatives. This study demonstrated that though parents may research information about vaccinations on social media or the internet, they still take their concerns to their healthcare providers. Koff et al. (2018) found that negative parental perceptions of vaccines produced the need to engage healthcare professionals to build well-informed and fact-based discussions between mothers and healthcare providers. Further examination is needed to explore evidence-based decision-making and levels of collaboration between mothers and providers.

I discovered that mothers do turn to social media in some ways for vaccination information; however, they take their concerns to their healthcare providers for clarification. Social media had a detrimental influence on mothers’ decision-making, which was evident in anti-vaccination websites that employ emotion-centric persuasion tactics. According to Ward and Budarick (2021), emotionality plays a significant role in decision-making.

Theme 2: Trust in Healthcare Professionals

The literature review suggested that vaccine information delivered by healthcare providers can impact and improve vaccine uptake. Findings confirmed the literature review results that mothers generally trust their healthcare providers. All 19 participants stated they trusted their healthcare providers to lead them in making the right decisions when it came to vaccines. This study confirmed that healthcare providers are a trusted source and in an excellent position to address vaccine hesitancy by building trust and rapport with mothers. Healthcare providers can also support the emotional and cognitive aspects of mothers’ decision-making about vaccinations.

Themes 3 and 4: Vaccine Safety and Side Effects

Mothers’ top concerns when choosing vaccines were efficacy, side effects, and safety. McDonald et al. (2019) discovered that mothers needed to do independent research, consider the advantages and disadvantages of vaccinations, get guidance from medical experts, and ensure vaccines were safe. More research should examine vaccine rejection and hesitation. Primary factors contributing to vaccine rejection and hesitation included concerns about potential adverse side effects and a general lack of knowledge about the vaccines (Miraglia et al., 2022; Rane et al., 2022). All participants believed immunizations were safe for their children; however, they were worried about vaccine contents, potential side effects, and long-term implications. Parents were more comfortable with older vaccines but were very skeptical of newer vaccines such as COVID-19 and HPV. Dudley et al. (2023) reported that the most prevalent concerns about COVID-19 vaccines involved how fast the vaccine was developed, potential side effects, and suspicion of the government and pharmaceutical companies. Participants had the same feelings regarding the COVID-19 vaccine. Of the participants, 16 out of 19 were concerned about the side effects of vaccinations in general.

Themes 5 and 6: Adequate Information and the CDC’s Recommendations

This study asked participants whether they believed adequate information on vaccines was available to make an informed decision. Additionally, participants were asked whether they adhered to the CDC’s recommended vaccine schedule. Seventy-six percent of the participants felt that there was adequate information, and 89% followed the CDC’s recommended dosage schedule. In the literature review, Pezzotti et al. (2018), Liang et al. (2018), and Picketing et al. (2020) researched how universal vaccination programs and the regulatory agencies such as the CDC, ACIP, and the FDA improve the prevention and immune response of vaccine treatable diseases. Mothers receiving vaccine information are presented with details derived from rigorous clinical trials, confirming the safety and effectiveness of the vaccine. This includes ensuring compliance with prescribing instructions, indications, and targeted populations. This study demonstrated that mothers trusted information provided by the CDC and their healthcare providers.

The HBM was used for this study to analyze and interpret my findings. The HBM's two primary constructs are the desire to avoid illness and the belief that an action will prevent a disease. The HBM considers the mothers' thought processes and decisions to vaccinate their children. The HBM helps predict health behaviors and the willingness of the mother to change behaviors once they have researched the vaccine and discussed it with their healthcare provider. The participants in this study trusted the advice of their healthcare provider over what they found on social media sites and the internet. Some participants did turn to social media to ask questions but did not let the information received make their final decision.

Limitations of the Study

The primary challenge of this study, addressed in Chapter One, was gaining access to social media groups and women’s support groups due to some participant's strong feelings against healthcare workers and lack of willingness to participate. Considering this potential obstacle, I recruited participants from Facebook, the Walden University participant pool website, and a local breastfeeding support group. I received the majority of participants from my personal Facebook page, asking my friends to share my post and the Walden University Participant Pool website.

Problems with researcher bias, transferability, and dependability were another possible drawback. In interpreting the findings, I considered the possibility of researcher bias because I dealt with mothers who refused immunizations in my former position as a nursery/NICU nurse. No obvious researcher bias was seen when reflective journaling was used. I found volunteers using my Facebook profile and the Walden Participant Pool, which allowed me to find some participants who were not local to me. To ensure transferability, participants were asked detailed, probing questions. In order to guarantee the stability and reliability of the data as well as the repeatability of the study, which provides dependability, justifications were given at various points in the design plan and during data analysis. These comparisons were made with the research question.

Recommendations

This study helps fill the gap in understanding where mothers get information to decide whether to vaccinate their children. The study results illustrated how social media can influence mothers. However, mothers took the information found on social media or the internet and discussed it with their healthcare provider to make an informed decision. It is evident that there is misinformation reported on vaccinations and horror stories that can scare mothers into not vaccinating their children; however, with open communication and trust in their healthcare providers, mothers will be able to make informed decisions.

Building trust and rapport between healthcare providers and mothers will open the door to the uptake of vaccinations. Mothers trust their healthcare providers. It is recommended from this study that healthcare providers listen to the concerns of mothers regarding vaccinations. If the mother has questions about vaccines, listen with an open mind to their concerns and discuss them in a language the mother can understand. Healthcare providers can also provide easy-to-read literature on the side effects, ingredients in vaccines, and how the vaccine is rigorously tested before coming to market for children.

Further studies are needed to determine what websites have factual information and what websites do not. Improving the available information to mothers would increase the uptake of vaccinations. If mothers know which websites are reliable, they might be more accepting of the information. There is an extra burden put on mothers to research the information they receive. While the CDC is a trustworthy information source, navigating the site to find specific information can be challenging for the average patient. The implications of this study recommend improving relationships between websites, social media, and healthcare providers to provide mothers with tools to determine if the information on their sites is credible. The change must be with the internet to ensure that fact-checking is performed and misinformation is removed. Nurses could benefit from reviewing evidence-based websites from the provider's perspective. Further research could provide a segway for the healthcare provider to provide a publication that lists credible sites for mothers with evidence-based information. Misinformation confuses mothers, and if they do not take that misinformation to their healthcare provider, they will make their decisions without being informed of the consequences of not vaccinating their child.

Further research is needed to examine the father's perspective regarding vaccinations. In the literature review, the articles I reviewed only stated “parent” or “parents.” The articles did not specifically identify if they were interviewing both mother and father, only the mother or father. According to Daley et al. (2018), the word “parents” appeared 44 times. In the study by Moon et al. (2019), the researchers referred to “parents” 54 times. Future research recommendations would be to break down the numbers to see if both parents agree with giving, delaying, or refusing vaccinations. In a research conducted by Ranji et al. (2021), it was interesting to find that a 2020 Women’s Health Survey showed that “seven in ten mothers of children under 18 say they are usually the ones who select their children’s doctor (68%), take children to medical appointments (70%) and follow-up on recommended care (67%)”. Further studies on this topic would be beneficial in determining who makes the decisions in the household. Future research could also determine if fathers are willing to be more involved in healthcare decision-making.

Another recommendation that needs further research is standardizing vaccination doses and schedules. As mentioned earlier in my results, one participant adopted a child from an orphanage in another country. The pediatrician in the United States noted that vaccines in other countries may often be split doses into multiple injections, weaker in strength, and on different schedules. There is a need to standardize vaccination doses, strengths, and schedules worldwide so that children who are adopted or families who move to a different country can be covered equally.

Implications

A positive social change happens when human interactions and relationships transform culturally through social institutions (Dunfey, 2019). This study contributes to positive social change as these results bring awareness to the healthcare provider where mothers get information about vaccinations. Mothers turn to social media and internet sites to research vaccination ingredients and side effects. A mother’s exposure to this misinformation can influence the mother to delay or refuse vaccinations. However, building a rapport between mothers and healthcare providers non-judgmentally can support positive social change. The first step toward creating positive social change is for mothers and healthcare providers to actively listen to each other, even when one side holds an opposing perspective. However, we should not stop at acceptance; we should strive to have conversations to find points of agreement that work for all parties involved.

Individual Implications

Social media alone does not constitute an intervention; instead, it serves as a conduit for interaction among those who wish to engage with one another. Consequently, measures must be taken to guarantee the data's precision and consistency, and professionals with the necessary expertise must facilitate group discussions. Positive social change at the individual level is more likely to occur when the mother and the healthcare professional have strong confidence in one another. Establishing transparency in all correspondence, recognizing moms' worries, and swiftly providing customized information in response to their inquiries can all help to cultivate this kind of confidence (Korn et al., 2018).

Organizational Level Implications

This study could be used at the organizational level to help healthcare providers understand why a mother may have reservations about vaccinations. Organizations that could benefit from this study are pediatrician offices, obstetric offices, family practice offices, and nursing faculty in the hospital setting. These findings can be shared with healthcare professionals through professional development opportunities. In turn, these healthcare providers will be able to educate more mothers about the importance of vaccinations. The hope is that the correct information provided to mothers will guide them in making an informed medical decision about vaccinations. Providing proper education to mothers is essential to increasing awareness. In turn, mothers will share their experiences with others via social media sites and counter the misinformation on the internet posted by anti-vaxxers. Working together, healthcare providers and mothers can promote positive social change by promoting vaccinations.

This study concluded that mothers turn to social media and the internet for information about vaccinating their children. However, I did not expect to find that mothers ultimately trust their healthcare providers to guide them in making an informed decision about vaccinations. Mothers want to make the right choice, and with so much information at their fingertips, distinguishing between truth and anti-vaccination hearsay can be a challenging task. Providing mothers with evidence-based information is crucial for empowering them to make informed decisions about vaccinating their children. As a vulnerable population, children rely on their mothers to make choices on their behalf. Just as Walden University has committed to fostering social change and sharing in a passion for improving the world, this study builds on the core mission to affect positive social change by using research and critical thinking to find ways of informing mothers of the benefits of vaccination through open communication (Walden, n.d.).

This study is based on observed and measured phenomena and derives knowledge from actual experiences rather than theory or belief. The interviewed participants relied on their experiences and knowledge guided by their healthcare provider to decide about vaccinations. This study's theoretical implication is that it will help healthcare providers discuss vaccinations with their patients. They will know that mothers trust their healthcare practitioners when vaccinating their children. Healthcare providers will need to guide mothers in making these decisions. Future research in this area should focus on how to debunk social media misinformation by steering mothers to trustworthy websites and evidence-based materials.

Recommendations for clinical practice from this study indicate that healthcare providers should continue to educate mothers on the risks versus benefits of vaccinations so that they can make informed decisions. Healthcare providers should also remain open to the mothers’ decisions if they decide not to vaccinate. Implications for educational practice are for healthcare providers (nurses, physicians, etc.) to understand the mothers’ decisions and not be judged mentally if the mother decides not to vaccinate. Healthcare providers need to be educated on where mothers get their information. If the mother states she saw on a social media site or google that a vaccine causes autism, then the healthcare provider needs to be able to educate the mom about any side effects that a vaccine can cause and steer the mom to evidence-based data to weigh the risks versus the benefits.

Conclusion

Social media will not be going away any time soon. The internet will continue to post misinformation. Healthcare providers must understand where mothers get their information about vaccinations. Based on the data analyzed in this study, I have concluded that mothers get some of their information from social media. However, they take that information to their healthcare provider to discuss before deciding about vaccinations. Social media and the internet are great resources for mothers, but it is up to the healthcare provider to steer mothers to evidence-based websites so they can make informed decisions. Vaccinations are the key to eradicating diseases. Suppose healthcare providers can tailor education to mothers so that they understand what they are refusing and how it can affect their child later in life. In that case, mothers will be more accepting of vaccines and stay compliant with the CDC recommendations.

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Appendix A: Research Questions and Interview Guide

Research Question

What influence does social media have on mothers’ perceived barriers in making decisions about vaccinating their children?

Interview Guide

The interview guide for this study will address how social media influences a mother’s decision-making process about vaccinating their children.

Vaccine Information

1. How do you get the most common information about vaccinations?

2. Have you ever discussed your vaccination concerns with health professionals?

3. Have you ever discussed your vaccination concerns with other parents or family members?

4. What is your main source of information about vaccines?

5. When you are exposed to negative reactions or information about vaccines, what do you do?

Delaying/Refusing Vaccinations

1. Do you currently observe the recommended vaccination schedule for your child?
2. Have you ever delayed or refused vaccinations for your child? If so, why?
3. What are your reasons for delaying vaccinations for your child?
4. What are your reasons for refusing vaccinations for your child?
5. In your opinion, why do some parents delay or refuse to vaccinate their children?

Vaccine Safety

1. What are your worries about vaccinations?
2. Do you think vaccines are safe for children?
3. Do you have any concerns about side-effects of vaccinations?
4. Do you think there is adequate information about vaccinations?
5. Do you have any concerns that the vaccines will not work?

Healthcare Professionals/Health Communities

1. Do you trust the healthcare professionals who suggest vaccinations?
2. What do you know about the role of vaccinations in health communities?
3. Do you have any negative experiences that would discourage your child's vaccinations?

Prompts

Prompts will be included in the interview process to expand on answers given by the participant. These prompts will be based on how responsive the participants is with their answers.

1. Tell me more about your experience?
2. Please provide an example.
3. What was that like for you?

Adopted by permission from BMJ Publishing Group Limited. Vaccine hesitancy from the parent perspective: protocol for a qualitative study from Iran, Moradi-Lakeh, M., Goharinezhad, S., Hoviedamanesh, S., Amirkafi, A., Zahraei, S. M., & Eshrati, B. 12(9) 2022.

Appendix B: Inclusion Criteria

The inclusion criteria's' purpose is to assess participants' participation through background and characteristics. These questions will be conducted via email to ensure that the participants meet the inclusion criteria. These questions will also ensure that no exclusions prevent candidates' participation.

1. Are you 19 years of age or older?
2. Do you have children between the ages of 0 and 18 years old?
3. Do you make medical decisions for the children who reside in your household?
4. Have you sought information about vaccinations with healthcare providers, social media platform, friends, or family?

Appendix C: Demographic Information

Participant Assigned Number:

Number of Children in Household:

Gender of children:

Age of Children:

Education Level of Participant:

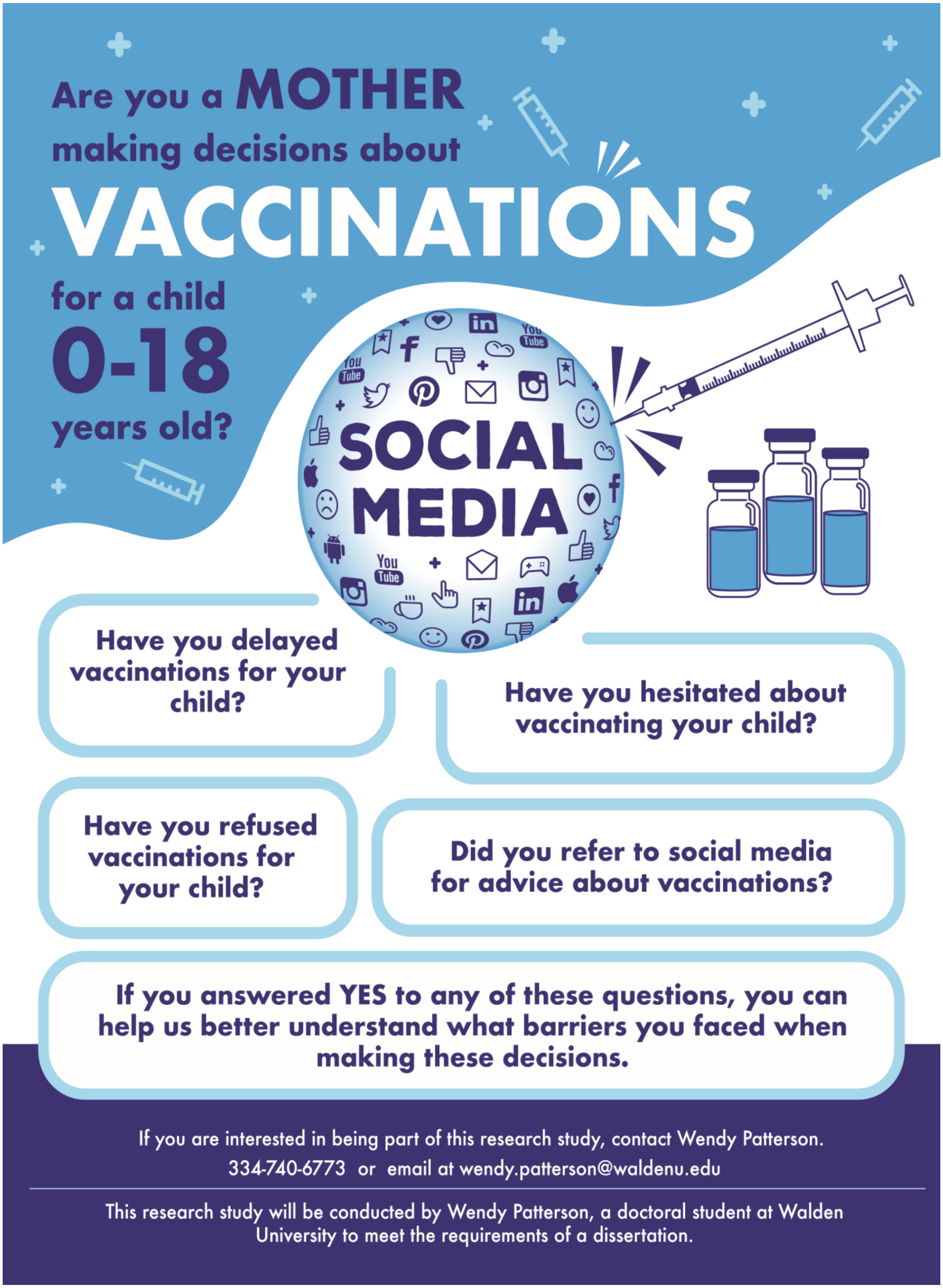
Participant’s age:

Marital Status:

Identified race of Participant:

Participants’ primary language:

Appendix D: Recruitment Flyer



Are you a **MOTHER** making decisions about

VACCINATIONS

for a child

0-18

years old?

SOCIAL MEDIA

Have you delayed vaccinations for your child?

Have you hesitated about vaccinating your child?

Have you refused vaccinations for your child?

Did you refer to social media for advice about vaccinations?

If you answered YES to any of these questions, you can help us better understand what barriers you faced when making these decisions.

If you are interested in being part of this research study, contact Wendy Patterson.
334-740-6773 or email at wendy.patterson@waldenu.edu

This research study will be conducted by Wendy Patterson, a doctoral student at Walden University to meet the requirements of a dissertation.

Appendix E: Study Information Email

Subject Line: Research Study Information

Dear __________,

Thank you for interest in my research study. My name is Wendy Patterson, and I am a doctoral student at Walden University. I have chosen to conduct my dissertation research on social media influences on mothers' decision-making about vaccinations. Social media platforms play a significant role in advising parents about vaccinations. Based on social media, some mothers decide not to vaccinate or delay vaccinations. In this study, I want to determine what social media sites are being accessed, what information is being asked, and if the information received is further researched to prove authenticity. I want to determine what strategies a mother uses to decide whether to vaccinate or not. My study intends to improve the research on what social media platforms are reliable and how to determine whether the information is valid. All responses and identities will be kept confidential. Participation in the study is voluntary, and you may withdraw from the study.

Attached you will find a consent form, demographic information form, and screening questionnaire. If you meet the criteria and wish to participate, please reply to this email with "I consent". The reply email address is: [redacted]. I will contact you to setup an interview at your convenience. The informed consent permits me to conduct interviews between you and me. The interview process will take place after informed consent has been received.

If you have questions or concerns, don't hesitate to contact me by phone at [redacted] or email at [redacted]. I appreciate your consideration.

Sincerely,

Wendy M. Patterson, MSN, RN

Appendix F: Consent

You are invited to take part in a research study about the social media influence of mother's decision making about vaccinations. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study seeks 5-25 volunteers who are:

- Mothers of one or more children 0 to 18 years of age.
- Mothers at least 19 years of age
- the primary decisions maker about vaccinations for their children.

This study is being conducted by a researcher named Wendy Patterson who is a doctoral student at Walden University.

Study Purpose:
The purpose of this study is to explore the influence that social media has on mothers when making decisions about vaccinations.

Data Collection Procedures:
This study will involve you completing the following steps:

- Complete an initial survey of inclusion criteria questions (5 minutes)
- Take part in a confidential, audio recorded interview (phone option available) (approximately one hour)

Here are some sample questions:
Vaccine Information

1. How do you get the most common information about vaccinations?
2. Have you ever discussed your vaccination concerns with health professionals?

Delaying/Refusing Vaccinations

1. Do you currently observe the recommended vaccination schedule for your child?
2. Have you ever delayed or refused vaccinations for your child? If so, why?

Vaccine Safety

1. What are your worries about vaccinations?
2. Do you think vaccines are safe for children?

Healthcare Professionals/Health Communities

1. Do you trust the healthcare professionals who suggest vaccinations?
2. What do you know about the role of vaccinations in health communities?

Voluntary Nature of the Study:
Research should only be done with those who freely volunteer. So, everyone involved will respect your decision to join or not.

If you decide to join the study now, you can still change your mind later. You may stop. The researcher will follow up with all volunteers to let them know whether they were selected for the study.

Risks and Benefits of Being in the Study:
Being in this study could involve some risk of minor discomforts encountered in daily life, such as sharing sensitive information. With the protections in place, this study would pose minimal risk to your well-being.

My oath as a Registered Nurse under the nursing code of ethics is to report any child abuse and child/elder maltreatment discovered during my interview process.

Participants may be known to the researcher professionally or personally, which may have potential relationship risk. If you know me personally or professionally, volunteering for this study or declining to participate will not affect our personal or professional relationship. This study is separate from my professional or personal role to anyone known to me.

This study offers no direct benefits to individual volunteers. The aim of this study is to benefit society by being able to help mothers make informed, evidence-based decisions about vaccinations. Once the analysis is complete, the researcher will share the overall results by emailing you a summary.

Payment:
The researcher will email participants a virtual $10 Target or Starbucks gift card.

Privacy:
The researcher is required to protect your privacy. The researcher will not use your personal information outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. If the researcher were to share this dataset with another researcher in the future, the dataset would contain no identifiers, so this would not involve another round of obtaining informed consent. Data will be kept secure by assigning each participant a code such as P1, P2, etcetera. Data will be kept for at least 5 years as the university requires.

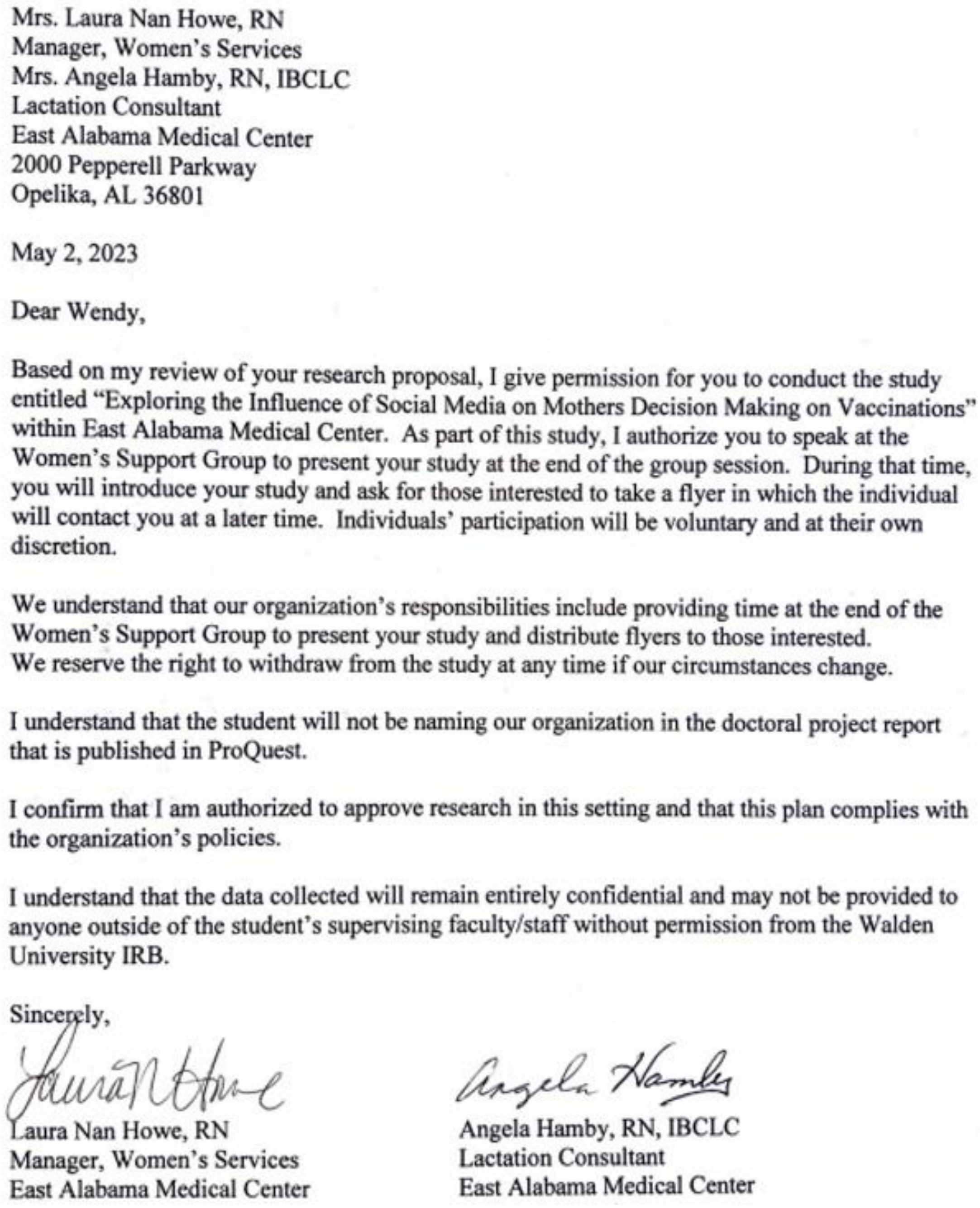
Contacts and Questions:
You can ask questions of the researcher by phone or email. If you want to talk privately about your rights as a participant or any negative parts of the study, you can call Walden University's Research Participant Advocate at 612-312-1210. Walden University's approval number for this study is # 05-18-23-0577524. It expires on May 17, 2024.

You might wish to retain this consent form for your records. You may ask the researcher or Walden University for a copy using the contact info above.

Obtaining Your Consent

If you feel you understand the study and wish to volunteer, please indicate your consent by replying to this email with the words, **“I consent”**.

Appendix G: Letter of Cooperation from a Research Partner



Mrs. Laura Nan Howe, RN
Manager, Women's Services
Mrs. Angela Hamby, RN, IBCLC
Lactation Consultant
East Alabama Medical Center
2000 Pepperell Parkway
Opelika, AL 36801

May 2, 2023

Dear Wendy,

Based on my review of your research proposal, I give permission for you to conduct the study entitled "Exploring the Influence of Social Media on Mothers Decision Making on Vaccinations" within East Alabama Medical Center. As part of this study, I authorize you to speak at the Women's Support Group to present your study at the end of the group session. During that time, you will introduce your study and ask for those interested to take a flyer in which the individual will contact you at a later time. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include providing time at the end of the Women's Support Group to present your study and distribute flyers to those interested.
We reserve the right to withdraw from the study at any time if our circumstances change.

I understand that the student will not be naming our organization in the doctoral project report that is published in ProQuest.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

Laura N Howe

Laura Nan Howe, RN
Manager, Women's Services
East Alabama Medical Center

Angela Hamby

Angela Hamby, RN, IBCLC
Lactation Consultant
East Alabama Medical Center