Description of educational techniques for childhood immunization hesitant parents

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**Abstract**

Childhood vaccine hesitancy proliferation led to the World Health Organization identifying it as one of the leading threats to global health in 2019 (World Health Organization, 2019). While hesitancy has been present since the beginning of vaccine development, fears have increased during the COVID-19 pandemic and vaccine roll out. There is ample research available about provider (ex: physician, nurse practitioner, physician assistant) communication and education regarding vaccines. Currently, there is very limited evidence about the nurse’s role in vaccine education and no evidence about an interprofessional approach. This lack of evidence poses a significant gap with opportunities to design more effective methods to educate vaccine hesitant parents. This project explored the strategies various professions, used to educate hesitant parents about vaccines to identify if any took an interprofessional approach. Individual interviews were conducted between January and March of 2021. The participants (n=7) had a variety of in-patient and outpatient experiences and included one pediatrician, one pediatric nurse practitioner, one family practice nurse practitioner, one school nurse practitioner, two registered nurses, and one pharmacist. The interviews were transcribed and coded for a qualitative thematic analysis. The results showed there were no shared standardized protocols or clear roles for all professions when it came to educating about vaccines. It was found that *Vaccine Information Sheets* produced by the CDC were foundational to the education. Across professionals, they emphasized relationship centered care with families. Future research should be done to design and test the effectiveness of an interprofessional intervention to educate vaccine hesitant parents.

**Description of educational approaches for childhood immunization hesitant parents**

In 2019, the World Health Organization named vaccine hesitancy as one of the leading threats to global health. Vaccine preventable diseases, such as measles, have been on the rise globally (World Health Organization, 2019). While healthcare access is a large barrier for many, vaccine hesitancy contributes to many of these outbreaks in countries where the diseases have been nearly eradicated. Vaccine hesitancy is defined as the “delay in acceptance or refusal of vaccination despite availability of vaccination services” (MacDonald, et al., 2015, p. 4163). This hesitancy can exist on a continuum from only accepting certain vaccines, delaying vaccinations, to refusing all vaccines. This phenomenon has been attributed to three factors: lack of confidence and fear of vaccines, complacency in seeing the need for vaccinations, and lack of convenience to receive the vaccine (MacDonald, et al., 2015).

Since the first vaccine (smallpox) was distributed in the 1800s, there has been hesitancy surrounding vaccines. In fact, it was not until the 1970s that the WHO pushed for increased childhood vaccination. Previous hesitancy was mostly found in lower class workers opposed to government’s making decisions for their children to be vaccinated. However, today’s hesitancy is often from the most educated and higher income brackets. The new wave of antivaccination originated from Wakefield’s article published in The Lancet. Although the article was later retracted, it led many to mistrust the Measles, Mumps, and Rubella (MMR) vaccine (Dubé et al. 2015). This distrust spread widely thanks to the rapid sharing of information and misinformation on the internet and through social media over the next decade. Subsequently, numerous conspiracy vaccine theories emerged and have been shown to account for increased suspicion about vaccines as well as a lack of trust in providers and government programs (Jolley & Douglas, 2014).

 As vaccines were rapidly developed for the COVID-19 pandemic, uncertainty and distrust in science increased in the United States especially around developing a safe vaccine in such a short timeframe. Confounding that, there are many who believe the virus is a hoax, are skeptical about the benefit of masks, physical distancing and hand washing despite evidence that supports these measures mitigate spread of the virus (Lehmann & Lehmann, 2020). Misinformation rapidly proliferated through social media increasing distrust while conspiracy theories about the vaccine were being propagated prior to the clinical trials completion. Social media platforms such as Facebook and YouTube used censorship to mitigate disinformation while providing reputable evidence (Niemiec, 2020). In addition to false messages leading to increased infection rates of the coronavirus, it contributes to an overall distrust in science, scientists, evidence-based practice, public health immunization strategies, and the healthcare system in general.

The Vaccine Data Tracking system managed by the Centers for Disease Control (CDC) reports an overall decrease in childhood vaccinations since the onset of the coronavirus was announced in March 2020. A CDC study suggest the drop in childhood vaccines may be a result of parents fear of COVID-19 exposure (Santoli et al., 2020). If these trends continue, there is an increased likelihood that concurrent vaccine preventable disease outbreaks will occur. To protect the health of the public and to prevent overburdening the healthcare systems, vaccine hesitancy must be addressed and mitigated.

 Numerous studies indicate providing vaccine guidelines and strategies to improve physician communication may increase vaccination rates (Gilkey et al., 2015; Henrikson et al., 2015; Shen & Dubey, 2019). Unfortunately, nurses’ and others of the healthcare team’s contributions in combating antivaccination are not mentioned. Mobilizing an interprofessional approach to increase vaccine uptake is important and allows each team member to contribute and to function at the full scope of their practice role. Teaching and counseling patients is within the scope of practice for a Registered Nurse (RN) and is expected as part of their client care (North Carolina Occupational Licensing Boards and Commissions, 2019). They often spend the most time with patients and their families and are positioned to educate and answer their questions. Patients often receive instruction from diabetic, ostomy, or wound care nurse educators. Nurses have been rated as the most honest and ethical professional across the last 18 years (Reinhart, 2020). Interestingly, education about childhood vaccines is most commonly left to physicians or nurse practitioners. Comparatively, flu vaccine education and encouragement are promoted by multiple providers (i.e. physicians, nurse practitioners, nurses, pharmacist, and medical assistants); agencies (i.e. workplaces, health departments), and media outlets (i.e. PSAs for TV, radio, and newspapers). Notably, the flu vaccination rate is only 51.8% for the 2019-2020 flu season despite this multifactorial approach (National Center for Immunization and Respiratory Diseases, (2020).

While the flu vaccination rate are low, individuals are less likely to select to receive a yearly shot. Comparatively, there is more data and education necessary to provide about childhood vaccines and the associated vaccine schedule than the flu vaccine. Childhood vaccination rates possibly could improve if nurses and doctors provided an interprofessional approach to address questions and concerns providing information and taking time to address vaccine hesitancy from a multidisciplinary approach. Additionally, using an interprofessional approach can incorporate many other members of the healthcare team such as medical assistants, pharmacists, nurse practitioners. There is limited research about the use of an interprofessional educational approach to combat childhood vaccine hesitancy.

**Literature Review**

 A clinical report published by the American Academy of Pediatrics (AAP) compiled multiple studies to provide explanations for why parents may be vaccine hesitant and provided recommendations for how to combat vaccine hesitancy (Edwards & Hackell, 2016). The recommendations published by the AAP are physician focused and support pediatricians as holding an important role in parents’ decisions to vaccinate. The authors stress the importance of developing rapport with parents, by presenting stories and anecdotes rather than just statistics and scientific evidence. The AAP cautions against discharging pediatric patients from practices due to immunization status. Additionally, there is an emphasis on addressing specific parental concerns, apprehensions, and myths.

Other studies have found that direct negations (for example, explicitly telling a parent they are incorrect) are ineffective at encouraging vaccinations for hesitant parents. Interestingly, in an earlier study, Betsch and Sachse (2013) found that stronger negations of vaccine hesitancy or conspiracy theories increased the perceived risk of vaccination as opposed to acknowledgement of minimal risk. This supports that stronger negations from the provider do not decrease hesitation, rather they potentially increase hesitancy. The authors utilized the Lancet’s MMR vaccine article as an example. Although the article was redacted and there are multiple studies refuting its findings, the disproven idea that vaccines can cause autism is still widespread. This strong negation example could also be reflected in any care setting, such as a provider saying there were no risks associated with a vaccine. Instead, the study found weaker negations acknowledging risk are effective at decreasing perceived risk of vaccinations. In this case, the provider could say: “I hear you are concerned about side effects, while there are rare cases of serious side effects, these are the most common mild side effects…” The authors state this assists in contending with negativity bias, which is defined as “the propensity to attend to, learn from, and use negative information far more than positive information” (Betsch & Sachse, 2013 & Vaish & Woodward, 2008).

 Opel et al. (2013) expanded on this research, analyzing the type of education the physician or nurse practitioner utilized and the providers impact on parent’s vaccine hesitancy. Researchers observed 111 instances of education about vaccines and determined the following: most providers initiate their conversations by presuming the parent wants to vaccinate, as opposed to beginning with parent’s questions and concerns. Conversely, when the physician or nurse practitioner discussed vaccinations with a participatory approach, parents were more likely to be resistant to vaccinations (p<.001). Finally, when the provider was met with hesitancy, persistent reiteration of the recommendation often led to vaccination. These findings greatly contest the shared decision-making model often seen in motivational interviewing where the provider will ask open ended questions to the patient or parent. While the opposition to motivational interviewing is a bold claim, the authors explain the indications for shared decision making are very complex, and vaccines fall into a grey area. The choice to vaccinate is a value driven decision which requires a shared mental model between the provider and parents leading to a decision and finally consenting to vaccinate. However, evidence supports vaccination as the best option which compels providers to educate assuming parents intend to vaccinate.

 Mohanty et al. (2018) analyzed pediatricians’ responses to vaccine hesitancy in primary care offices through a series of interviews. Their findings demonstrated that a large majority of the physicians cited time as the barrier to effectively communicating about vaccines. For hesitant parents, pediatricians reported counseling could take up to 30 minutes. This huge time demand within a time constrained practices highlights the need for additional members of the healthcare team to participate in vaccine education so that the providers could move forward with their schedule of caring for other patients. A barrier is that practices are not reimbursed for nurse only immunization counseling and administration appointments. This monetary impact reduces the likelihood of an interprofessional educational approach, even though nurses have the expertise and capability to educate and it falls within their scope of practice. The addition of different professionals addressing concerns may decrease vaccine hesitancy.

 Mossey et al. (2019) researched nurse’s education to parents (n=16), and the parents’ perception of their education in a Canadian health clinic. The nurses educated families to guide their decision making. Both the nurses and the parents shared a desire to protect the children. Notably, parents perceived information more trustworthy if it agreed with beliefs they already held.

Bowling (2018) authored a guide for evidence-based nursing interventions for enhancing vaccination rates. She suggested a unique approach of comparing the side effects of vaccinations to the symptoms of the illness it prevents. Additionally, Bowling suggests the nurse used anticipatory guidance for parents by offering them written information about the next vaccine appointment. This prepared parents for the next visit, and provided them with the opportunity to ask further questions.

 Questions about vaccines also came up outside of the clinical setting, as most public-school districts require childhood vaccinations for enrollment. Luthy et al. (2016) completed a systematic review of evidence-based interventions for school nurses speaking to parents about vaccinations. The authors first stressed the importance of creating an open and nonjudgmental space for parents to ask questions. This environment allowed hesitant parents a greater likelihood to respond favorably to education targeted to reduce hesitancy. Secondly, the nurse should avoid fear tactics if the parent is hesitant, and instead discover the process the parents used to reached their conclusions. Next the nurse should individualize the education plan to the specific concerns. Also, educational materials about vaccinations should be readily available. Lastly, the authors provided a list of common questions and evidence-based answers for the school nurse to use when discussing vaccines with parents.

 Studies supporting an interprofessional approach to combating vaccine hesitancy were not found, even though each member of the healthcare team can educate parents about vaccinations. Most studies discussed pediatric providers’ (i.e. medical doctors and nurse practitioners) role in educating about vaccines. Limited literature discussed the implications of vaccine education by nurses in different settings. There was very limited evidence directly addressing pharmacists, medical assistants, and non-pediatric providers such as family practice doctors or nurse practitioners’ role in vaccine education. The only article that addressed pharmacists’ interventions was published in 1997 and their recommendations have not been updated since (Rovers et al., 1997).

Based on this review, there is a wide variety of evidence on how to educate parents on vaccination. However, there is a gap in the evidence for the use of an interprofessional educational approach about vaccines, and gaps concerning the inclusion of some professionals. While this project did not provide evidence to demonstrate support for an interprofessional approach, it provided insight regarding how different professions approach vaccine hesitancy. This study explored common practices used by the interprofessional healthcare team to educate parents about vaccination including how they assist patients/parents overcome vaccine hesitancy.

**Methods**

The University of North Carolina Institutional Review Board, Office of Human Research Ethics determined this project did not require IRB approval.

**Sample**

The sample was seven interprofessional healthcare providers with inpatient and outpatient experience involved in vaccine discussions with parents, including:one pediatrician; one family practice physician; one pediatric nurse practitioner; one family practice nurse practitioner; one physician’s assistant; one pediatric RN; one school RN; one public health RN; one medical assistant; and one pharmacist. Participation was voluntary and indicated consent. All participants received a $25 gift card as a token of appreciation for their participation.

**Recruitment**

The participants were recruited using a convivence, snowball sampling strategy. Recruitment was done via emails to select pediatric and family care practitioners, community health practitioners, and school nurses in North Carolina. Semi-structured scripts of communications are found in Appendix A. If a member of the healthcare team agreed to participate, an interview was scheduled via email. A single follow-up email was sent out if an initial response was not received.

**Data Collection**

The interviews were conducted over Zoom using a semi-structured guide (Appendix B). The interview focused on how the participant educated parents of pediatric patients about vaccines and explored strategies used to overcome hesitancy. Additionally, the use of an interprofessional approach was explored. The interview guide consisted of 9 open-ended questions and 3 optional open-ended questions. The interview was recorded using Zoom’s platform and transcribed verbatim. All data was stored in an encrypted laptop and file throughout the duration of the data analysis and will be permanently deleted from the computer within a year of project completion.

**Analysis**

This study aimed to identify common practices used by the interprofessional healthcare team to educate parents about vaccination. An inductive thematic analysis was used to analyze the interview transcripts. Transcriptions were coded using Dedoose 8.3.45 (Dedoose, 2021) and completed by the primary investigator (SLL). One transcript was coded by a third party colleague (MJB) to analyze the similarities in the coding completed by the primary investigator. The primary investigator also utilized member checks and created memos throughout the duration of the interviews.

**Results**

**Participants**

Eight professionals participated in the study: one pharmacist and one pharmacist student with outpatient experience, one pediatrician with inpatient and outpatient experience, one pediatric NP with outpatient experience, one family NP with outpatient experience, one school NP with outpatient experience, one pediatric RN with inpatient and outpatient experience, and one pediatric RN with only outpatient experience were interviewed between January and March of 2021. The COVID-19 pandemic and vaccine rollout coinciding resulted in increased scheduling conflicts and responsibilities preventing participation of additional professionals. This lack of participants combined with the limited number of interviews per profession introduced attrition and sample bias to the study.

**Major Themes**

Through coding, five major themes were identified regarding how different professionals educate vaccine hesitant parents and how they work together. Primarily, there appeared to be significant role overlap between different professionals and minimal clear delineation of roles between professionals. There was an emphasis placed on Vaccine Information Sheets (VIS) and handouts as well as building rapport and trust between family members and the healthcare team. Pharmacists’ regulation also greatly impacted their ability to work with and educate vaccine hesitant parents. Lastly, opinions about the impact of the COVID-19 pandemic and vaccine rollout on vaccine hesitancy varied widely among members of the healthcare team.

***Lack of Role Delineation and Role Overlap***

Throughout the interviews, multiple professionals recognized their role as educators, but at different levels. None of the participants were from the same office or hospital. The roles did vary across location, but the lack of standardized roles for any particular office was clear in nearly every interview. For example, one provider acknowledged roles depending on individuals within their office:

For each provider it is different. Each provider has either a nurse or a medical assistant helping them. And so, I think it also, depends on the comfort level of the nurse or medical assistant as to how much education they do versus how much education the provider does. So, for instance, my nurse is an LPN, and so, she is not comfortable with kids for the most part.

Another provider demonstrated the varying nature of education dependent on the vaccine the patient was in for and the number of questions parents had:

Normally, I guess it is just a team effort. Everyone does. I think it starts out with the nurse assistants or the nurses who put the babies or the patient in the room and kinda tell them which ones are recommended. And kind of the way most pediatric practices go, they work those up ahead of time to see what vaccines are needed for that visit. And then we go over it in the room to various degrees, most parents probably have no questions and you know you tell them the side effects. Some parents have a lot of questions, some parents decline. And so, the pediatrician kind of is the second layer and spends various amounts of time on the vaccines kind of after the preliminary one is. And then for influenza, it’s a little bit different.

Additionally, other professions were nearly twice as likely to identify nurses as vaccine educators compared to nurses identifying themselves as vaccine educators. Nurses equally identified themselves as vaccine administrators. The education nurses provided focused on possible side effects and anticipatory guidance on how to address them. Furthermore, the nurses and other professionals were more likely to identify providers as educators. Specifically, when it came to the education of vaccine hesitant parents, both the providers that were interviewed as well as the nurses identified the provider as the sole educator.

***Legal Restrictions***

Among all the professions interviewed, pharmacists were most limited in their ability to educate parents about vaccines. The participants identified state legal restrictions prohibiting pharmacists from administering childhood vaccines as a barrier to educating parents, since parents may not see them as an education source. One participant stated:

So, for North Carolina law right now it’s kinda like a different area. Because federal guidelines put this blanket over everybody, all healthcare providers. We are able to do pediatric routine immunization under the federal law. North Carolina is still hesitant to let us as in pharmacists do more of the routine immunization. But we are, they did expand flu vaccines for us. Just under NC law recently. The lowest age I could do was 6-10 years old, but I had to have a physician’s prescription to do it, and then from I think it is 12 and up I can go get the specifics but I think it’s 12 and up, I could do it under my protocol, under NC law.

They also believed that should they be able to vaccinate and educate parents about vaccines, hesitancy rates would decrease.

A pediatrician also recognized legal restrictions as a barrier to providing education to parents who refuse vaccines, as government evaluations discourage having non-immunized patients within each practice:

Healthcare is getting ready to change to the point that is you have non-immunized patients in your practice it is a negative for your practice so it makes your practice not look very good. So it is kind of like the good teachers, the teachers look great if they have the AG students and they are at [private schools] and the kids are geniuses and “oh they are a great teacher” but it could be a horrible teacher but the kids are all great. You could be the best teacher in the world and if you’re teaching very disadvantaged inner-city youth that don’t have parents that want them to do homework and you get them from being F students to C students, that may be the best teaching job ever. But you can’t, we don’t function and the government and society wants evidence, and the way they do evidence isn’t really a great way to do it. But this has become a quality measure we are also being forced by the environment not to take any non-immunized people in our practice.

This pediatrician acknowledged discharging patients due to their non-immunized status contradicts the AAP recommendations.

***Vaccine Information Sheets (VISs) and Handouts***

A variety of different professionals used VISs and handouts. These handouts could include the FDA inserts about the vaccines or individual office-made handouts. One nurse shared that it is the primary form of education they provide prior to the doctor’s visit:

There are instances where the parent when we do the check in part, they want to know about the vaccines the patient is getting. So, we use that as an opportunity for us to give them handouts, give them information about what we know about the vaccine. So mainly the doctor but nurses and assistants can also share information and educational information.

Another nurse stated that the VIS is the primary form of education they provide: “As far as the education, it is mainly VIS, Vaccine information Statements and then kind of the doctor letting them know what these vaccines are for and what they are to prevent.” Some form of a government handout, VIS, or office-made handout was addressed in all interviews but one.

***The Impact of the COVID-19 Pandemic and Vaccine Rollout***

A clear majority of participants believed that COVID-19 will decrease vaccine hesitancy over time. Repeatedly, participants cited the horrific outcomes of COVID-19 and clear repercussions of not having a vaccine as a reason for parents to be more willing to vaccinate. One provider stated:

I feel that [COVID-19] may give them the opportunity to reconsider any doubts and see that when you have something that can be controlled through a vaccine that they may be a little more agreeable to getting it done. Especially when they see how horrible the impacts this has had.

A nurse recognized the ability to use the mortality of COVID-19 as a more salient teaching point for hesitant parents and one nurse thought of a personal example of a parent that refused vaccines for her children but was willing to get the COVID-19 vaccine:

We actually have a mom that does not give her kids vaccines but she said “I would give my kids the covid vaccine when it is available for their age. So, we found that pretty surprising she doesn’t want to do the other required or mandatory by the state vaccines, but she’ll do COVID vaccines. Maybe after her kids get the COVID vaccines when it is approved for their age and she sees that it protects them and they would be fine with it. Maybe she’d change her mind about the rest of the vaccines.

One pediatrician drew a parallel between this pandemic and the H1N1 pandemic in 2009:

I will say H1N1 seemed to help with vaccine hesitancy on influenzas… Pediatricians historically make a fair bit of our income during the flu epidemic we have to work these horrible hours but we see a lot of patients. We don’t have that anymore and most people are pretty excited about that, we have not had a very bad influenza epidemic in a while, people are getting their influenza vaccines so from that I think it is good… I mean you compare, you could draw a parallel with that, maybe it will get better. People are kind of panicking to get their COVID vaccine so it may truly make vaccinations increase.

While many participants saw COVID-19 as an opportunity for encouraging vaccinations, one nurse practitioner felt that it would not change people’s minds about vaccines and potentially increase hesitancy:

People seemed very excited about [the COVID-19 vaccine] when the pandemic first started people were more scared and apprehensive, so, at that point I thought, “wow people are gonna really want this vaccine and then that is going to make a great argument for other vaccines”…Well that is not quite how things have panned out for me. Um at this point, so, I don’t know that covid will change how vaccines are viewed that much unfortunately. Maybe for some people, but a lot of my patients are very hesitant about the COVID vaccine…They didn’t really get the flu shot in the first place, they don’t want the COVID shot either because they are very distrustful in the way vaccines are manufactured. But then you have other folks who think that they will be fine, they have had covid and they didn’t, they weren’t very symptomatic, or they don’t know anyone who has lost their life to covid, or it hasn’t touched their lives as much because they work from home anyway and so, they really hadn’t had to change what they’ve done. And so, then those folks are like “no I don’t really want it.

The pediatrician acknowledged that COVID-19 has already decreased childhood immunizations:

At least across the state [childhood] immunization rates are down because of covid and that is more because people are scared of getting their kids and bringing them to the office because they don’t want their kids to get sick. We have done a pretty could job compared to other practices in the state but I will tell you the state immunization branch has been down I don’t think that is refusal, I think that is just fear.

This pediatrician was the only participant to acknowledge the decrease in childhood immunizations, however it has been documented nationally since May, 2020 (Santoli et al., 2020).

***Trust in Providers***

Multiple providers recognized developing rapport and using relationship centered care was beneficial in the education of vaccine hesitant parents overtime. One nurse recalled:

You know if you went to your doctor’s office for your whole life and you know them, what you say you’d probably trust because you go their all the time getting care and stuff like that. So that is what it is at our office to. It is very patient centered.

A pediatrician echoed this sentiment:

I did kind of feel that kicking people out of your practice for vaccine refusal caused more harm than good. And the AAP over the past several, over the past 20 years has not really recommend that. They were more of keep them, make sure the kids are in the practice to try and educate the parents as best as you can, and often if they come to trust you, they’ll trust your opinion that these vaccines are safe.

An RN agreed that giving the parents time to trust would help:

[Hesitant parents] really have to think about it. I don’t think those those that struggle with getting the vaccine, or getting any vaccine they have to think about it. And usually the next visit is when they may open up a little more, and it may take a third visit to get a vaccine administered. So, it may take more than one visit.

Other providers agreed that it may take multiple visits and contacts with parents for them to agree to immunization. One NP shared their strategy:

Sometimes leaving it with, ‘may I put you on my list to circle back around it in a month and talk to you again about this.’ Sometimes that’s a good way too. I have had plenty of people who said ‘no, I am going to feel the same way in a month don’t worry about it.’ But I have had people who have said ‘circle back with me, maybe in a month I’ll be thinking differently.’ Sometimes giving them the option if they are flat no’s, give them an option, and put it on your calendar.

**Discussion**

This project found there was no set standard for education about vaccinations within a practice, and physician and nurse practitioner providers tended to be responsible for education. Due to time constraints for providers, it is important to use each member of the healthcare team to provide vaccine educations. Additionally, Opel et al. (2013) found that repetition of the recommendation beyond the interaction between the physician and the parents may decrease their hesitancy. For example: the guidelines and VISs could be provided by medical technicians during initial check-ins when giving the parents their paperwork. During intake, the nurse could offer the parents more information and guidance about vaccine safety and potential side effects before the provider comes to discuss further with the parents. First, this gives parents the opportunity to ask the nurse questions. Second, once parents are made aware of this information they could think of more direct questions for the provider. This education could happen even outside of the clinic setting. School nurses could provide parents with information regarding necessary childhood vaccinations when they are enrolling them in school and provide the parents with resources for where they can find more information about vaccines and where they can have their child vaccinated. Parents could call a nurse hotline for routine questions at the pediatrician’s office, or a nurse hotline at a public health department to get information and ask questions about vaccines.

 There were also clear legal restrictions in place that prevented pharmacists from providing and educating about childhood vaccinations. Pharmacists that can administer and educate about other vaccines should also be allowed to administer and educate about childhood vaccines. Legal barriers also impacted physicians in their ability to retain families who do not vaccinate and provide the parents with further education and opportunities to vaccinate in the future. The AAP recommends that offices heavily consider the dismissal of patients due to their immunization status. Preventing parents from receiving medical care at an office that will provide vaccine education is a complex ethical issue. The AAP also acknowledge that there is no evidence currently supporting this practice although some evaluation standards are pushing practices to this decision (Edwards et al., 2016).

With limited time to build the rapport, pediatric offices are not able to form a trusting relationship with families who are hesitant about vaccinations if they are only limited to one visit. Trust in healthcare team members, pediatric offices, and providers are crucial in the education of vaccine hesitant parents. Discharging patients because of their immunization status violates the trusting patient provider relationship. Additionally, if patients are discharged from practices that require vaccination, they must seek care elsewhere. Those practices that accept non-immunized patients may not provide them with the same quality of education about the importance of vaccination.

Mohanty et al. (2018) also recognized that offices often are not reimbursed for nurse only immunization appointments (both for administration and education). These legal barriers, both at the state and federal level impose a significant hinderance to public health by not providing more opportunities to educate and vaccinate. Ultimately, integrating different professions expertise to inform and educate patients and families around vaccines should be maximized to promote the health of the patient as well as public health.

 The impacts of the COVID-19 pandemic continue to be widespread. Fear of catching COVID-19 has presumably caused a decrease in childhood immunizations. The long-term effects of this decrease are unknown, but it is up to healthcare providers and public health officials to mitigate the risk of concurrent preventable disease outbreaks. Almost all the participants interviewed believed the COVID-19 vaccine distribution would positively impact vaccination rates and potentially decrease childhood immunization hesitancy, but some were unsure. The impact of COVID-19 on vaccine uptake is yet to be determined. Future studies are needed to establish if the COVID-19 pandemic changed hesitant parents’ opinions on vaccination.

**Limitation and Future Studies**

This study was limited due to small sample size. The study was further limited by the snowball and convenience sampling strategy. Due to attrition bias and the nature of the study, these findings are not generalizable. However, they do highlight the potential for improvement in the education of vaccines and the possibility of future research. These future studies could repeat this study with more rigorous sampling and more participants, or they could expand on this project. Future studies could include looking at different professions approaches to education, expanding on the healthcare professionals that were not included in this study, and evaluating patient collaboration in education. Ideally, a set intervention of interprofessional education could be implemented and evaluated through a randomized control trial to see if it decreases vaccine hesitancy compared to the current standard of practice. This could be done on a small-scale quality improvement project for a single office or larger scale testing including multiple different offices. All these future studies have the capacity to add to the knowledge base about vaccine hesitancy and create guidelines that would decrease vaccine hesitancy and improve the health of the public.

**Conclusion**

 Hopefully with the COVID-19 vaccination rates on the rise, cases of COVID-19 will decrease, but the pandemic provides a great example for the need to decrease vaccine hesitancy. The pandemic has provided a clear picture of what can happen when there is not a vaccine available to prevent illness, and if the healthcare team does not work together to combat vaccine hesitancy, outbreaks of preventable disease will continue to grow. This project provided strategies that different healthcare professionals have used when educating parents about vaccines and demonstrated the need for a better system of education. Interprofessional teamwork has proven to be critical to the COVID-19 vaccine rollout. It also is critical to the education and administration of childhood immunizations.

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**Appendix A**

**Recruitment and Follow Up Scripts**

**Initial Recruitment Email:**

Dear [name/office],

I hope this email finds you well. My name is Sarah Letchworth and I am a current senior in the School of Nursing at UNC Chapel Hill. This year, I am completing an honors project in which I want to gather information about how different professions educate vaccine hesitant parents about immunizations. I would like to interview select professionals via Zoom at a convenient time in your schedule (approximately 30 minutes). Currently, I am seeking [list professions] to interview about this topic, and am wondering if you would be interested in participating? I appreciate your consideration.

Thank you,

Sarah Letchworth

**Follow Up Phone Call/Email:**

Hello!

My name is Sarah Letchworth and I am a current senior in the School of Nursing at UNC Chapel Hill. I recently sent [you/your office] an email regarding an honors project I plan to complete. I am reaching out to see if [you/any [professions]] would be interested in participating? (pause here) The project consists of short, less than 30 minutes, zoom interview to learn how different professionals educate vaccine hesitant parents about immunizations.

Thank you, I appreciate your time.

**If no answer or if sent over email, the above message will be modified:**

 without “Thank you, I appreciate your time” and instead include “If you could call me back my cell number is 252-933-9086, and again, my name is Sarah Letchworth. Thank you for your time!”

**Email to set up interview time:**

Dear [Name],

Thank you for offering to participate in my honors project. Participation is voluntary, and a $25 gift card will be sent following the interview as a thank you. I am excited to learn from your experiences. Please send me some times you are available in the next week, once I hear from you I will set up a ZOOM meeting.

Thank you,

Sarah Letchworth

**Zoom invitation email:**

Dear [name],

I appreciate you finding a time to meet with me. Here is the zoom invitation and password for our meeting: [insert zoom link] [Password: Vaccine]. The zoom interview will be recorded for note taking purposes only, and no personal information will be saved. Following the completion of my notes, I will permanently delete the recording of the interview. I look forward to meeting with you.

Regards,

Sarah Letchworth

**Thank you letter script:**

[Participant name],

Thank you so much for taking the time to talk with me about how you approach vaccine hesitant parents. I really appreciate your perspective, and it will definitely help me as I complete my project. After our interview I now have a better understanding of how [profession] educate parents about vaccines. Thank you again!

Best wishes,

Sarah Letchworth

**Appendix B**

**Semi-Structured Interview Guide**

Participation indicates consent and is voluntary.

* Do you work in the inpatient setting or outpatient setting?
* In your setting, who does the parent education about vaccine? [*If not this professional, I will ask what is the role of the person who is providing the vaccine education and how do they do that.]*
* Do you work with other professionals within the healthcare team when educating parents about vaccines? If yes, who do you collaborate with? Describe collaboration.
* What role do you feel [profession] should play when it comes to educating parents on vaccines? Why?
* Describe how you educate/interact with vaccine hesitant parents as a [profession]:
* Tell me about a time you encountered a vaccine hesitant parent as a [profession].
	+ How did you handle that encounter?
	+ Reflecting on that interaction, would you handle it differently now? If yes, how?
* How do you feel the COVID-19 pandemic and the new vaccines will impact vaccine hesitancy?

If professional has experience working in both settings (hospital and clinic/office practice), the following questions will be posed.

* Does your role in parent education around vaccines differ depending on the setting (hospital or clinic/office practice)?
	+ How does the healthcare team coordinate parent education about vaccines in each setting?
	+ Is there a difference in the approaches to parent education about vaccines across settings? If so, describe the difference.

\*Questions may be clarified for the interviewee as necessary.