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### Factors Influencing Vaccination Rates in Children Under Two in Southeast Kansas

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FACTORS INFLUENCING VACCINATION IN CHILDREN UNDER TWO

A Scholarly Project Submitted to the Graduate School  
in Partial Fulfillment of the Requirements  
for the Degree of  
Doctor of Nursing Practice

Danielle Bennett

Pittsburg State University

Pittsburg, Kansas

May, 2022

# FACTORS INFLUENCING VACCINATION IN CHILDREN UNDER TWO

An Abstract of the Scholarly Project by  
Danielle Bennett

## **Introduction**

A large Federally Qualified Health Center (FQHC) in Southeast Kansas has a 37% compliance of children completing the recommended combo 10 primary vaccination series before their second birthday. An additional 20% of children would be compliant if the flu vaccine was excluded, raising the compliance rate to 57%. This is still below the national average of 68-75%, leaving many children in Southeast Kansas and northeast Oklahoma unprotected from preventable childhood diseases.

## **Purpose**

The purpose of this scholarly project was to identify barriers to vaccination, including vaccine hesitancy and socioeconomic barriers affecting completion of the primary vaccine series, or combo 10, in children under age two in Southeast Kansas.

## **Materials/Methods**

This descriptive study used a validated questionnaire, the Searching for Hardships and Obstacles to Shots (SHOTS) survey to gather information about parental attitudes toward vaccination and socioeconomic barriers that may be affecting vaccination rates in children under the age of two in Southeast Kansas.

## **Results/Conclusion**

Concerns about shots was the most problematic for this population, followed by importance of shots, then access to shots. Although concerns about vaccines may contribute to low vaccination rates, demographic data indicate that 77% children are fully

vaccinated to the knowledge of the parent/guardian, implying that there are likely other factors that are contributing low vaccination rates.

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## **CHAPTER I**

### **Introduction**

#### **Description of the Clinical Problem**

Vaccines have been one of the greatest accomplishments of modern medicine and have been very effective in reducing infections, morbidity, and mortality in the United States and across the globe (Centers for Disease Control and Prevention (CDC), 2018). Due to routine vaccination, many diseases that were once common and life threatening, such as diphtheria and polio have become less than a memory to most Americans. According to the CDC, it is true that many diseases that were once prevalent are now dwindling which may cause some to question if vaccines are still necessary and beneficial. However, the organization continues to recommend that communities keep vaccinating until the disease no longer exists. Even if there are only a small number of cases, without vaccination the disease can easily spread and quickly undo years of progress. Despite the proven success of vaccinations, many children remain unvaccinated or only partially vaccinated, and many parents choose to delay or refuse vaccines for their children. Because of this, measles, pertussis, and other preventable diseases have been on the rise (Papachrisanthou et al., 2016, p. 304).

The CDC's Advisory Committee on Immunization Practice (ACIP) provides recommendations for immunizations based on age. According to the ACIP, children

should receive what is referred to as the combo 10 vaccine series before their second birthday. This includes four doses of diphtheria, tetanus, and acellular pertussis (DTaP), three doses of inactivated poliovirus (IPV), three doses of hepatitis B (HepB), two to three doses of rotavirus, three to four doses of haemophilus influenzae type B (Hib), four doses of pneumococcal conjugate (PCV), one dose of measles, mumps, and rubella (MMR), one dose of varicella, two doses of hepatitis A (Hep A), and at least two doses of seasonal influenza vaccines. This vaccine schedule is endorsed by many professional and regulatory organizations, including the American Academy of Pediatrics, the American Academy of Family Physicians and the National Committee on Quality Assurance (Papachrisanthou et al, 2016, p. 304).

Healthy People 2030 has set a goal for 90% of children to have four DTaP vaccines before their second birthday and reports a current compliance rate of 80% (Healthy People 2030, 2021, para 1). The National Committee on Quality Assurance collects data through the Healthcare Effectiveness Data and Information Set (HEDIS) and reports a compliance rate of 68-75% for the combo 7 vaccines in 2020 (National Committee on Quality Assurance, 2022), however, the combo 7 does not include vaccines for Rotavirus, Hepatitis, A, or influenza. According to HEDIS, the national average of children fully immunized for influenza was 51-72% in 2020 (National Committee on Quality Assurance, 2022), which can dramatically drop compliance for the combo 10.

Community Health Center of Southeast Kansas (CHCSEK) was the organization chosen for implementation of this project. CHCSEK is a large Federally Qualified Health Center (FQHC) with 17 clinics across southeast Kansas and northeast Oklahoma. The FQHC had a 37% compliance rate of children completing the recommended combo 10

primary vaccination series before their second birthday in 2021. An additional 20% of children would have been compliant if the flu vaccine was excluded, raising the compliance rate to 57%. This is still lower than the national average, leaving many young children in Southeast Kansas and northeast Oklahoma unprotected from preventable childhood diseases.

### **Significance of the Problem**

According to Healthy People 2020 (n. d.), up to 300 children die yearly in the United States due to vaccine preventable diseases. Healthy People 2020 also reports “for each birth cohort vaccinated with the routine immunization schedule society saves 33,000 lives, prevents 14 million cases of disease, reduces direct health care costs by \$9.9 billion, and saves \$33.4 billion in indirect costs” (para. 4). Updated data is not provided in Healthy People 2030.

Yaqub et al. (2014) state that health care providers are the most trusted source of vaccine information. Healthcare providers begin developing relationships in the antenatal and early post-natal period (Taylor et al., 2017, p. 25), which is also when parents begin to make to vaccination decisions (Ebby, 2017, p. 23) and may also begin vaccine hesitancy (Glanz et al, 2015). These relationships become very important as developing trust and providing unbiased education can improve vaccine compliance (Trojanowski et al, 2019, p. 450). “One of the most effective tools to overcome vaccine hesitancy is proper provider communication” (Papachrisanthou et al., 2016, p. 308). According to Trojanowski et al. (2019), “Nurses are uniquely equipped to influence positive health behavior change because of the high degree of trust afforded to our profession” (p. 450).

This puts primary care providers in a very influential role related to patient’s vaccination decisions.

**Specific Aims/Purpose**

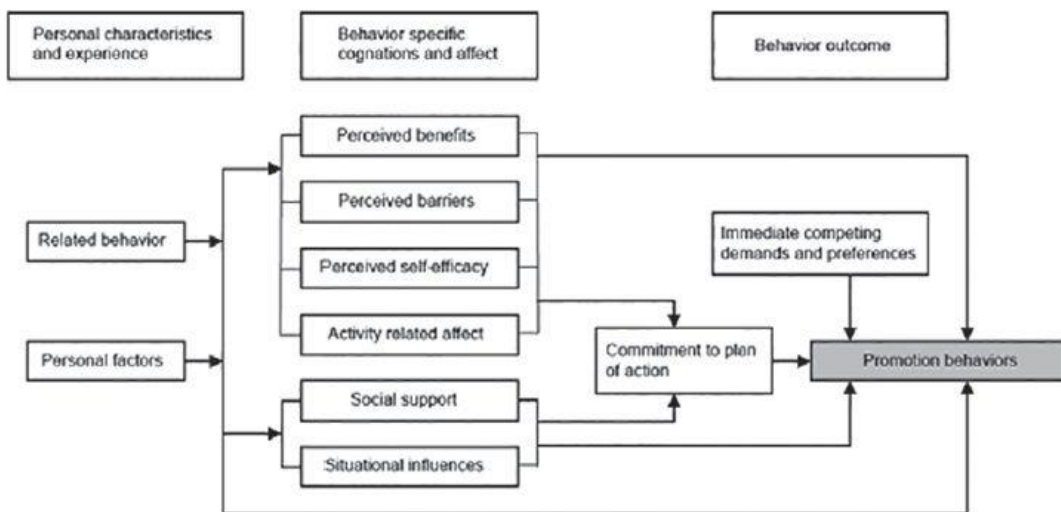
The purpose of this scholarly project was to identify barriers to vaccination, including vaccine hesitancy and socioeconomic barriers affecting completion of the primary vaccine series, or combo 10, in children under age two in Southeast Kansas.

**Theoretical Framework**

Pender’s Health Promotion Model assumes that health care providers are part of the individual’s interpersonal environment, exerting influence on experience and personal factors (Petiprin, 2020). This model demonstrates how providers can exert influence on health behavior and decision making related to vaccination. This project aimed to identify the factors that influence vaccination behaviors to contribute to the development of interventions to promote vaccination.

**Figure 1**

*Pender’s Health Promotion Model*



Note: Pender's Health Promotion Model. Reprinted from *Nursing Theory*, by Petiprin, A., 2020, <https://nursing-theory.org/theories-and-models/pender-health-promotion-model.php>.

### **Project Questions**

The key project questions were the following: What are the primary factors influencing vaccination? Are there barriers to vaccination, including vaccine hesitancy or socioeconomic barriers that are keeping children under age two from completing the combo 10 primary vaccine series in Southeast Kansas?

### **Research Questions**

1. Does the parent/guardian have a knowledge deficit regarding vaccine preventable diseases?
2. Does the parent/guardian have knowledge deficit of the recommended well child check and vaccination schedule?
3. Does the parent/guardian know where to obtain vaccinations?
4. What are the barriers for parents/guardians of children under two to obtaining vaccinations for their child?
5. What are parent/guardian concerns about recommended vaccines?

### **Definition of Key Terms/Variables**

- Vaccine – “A product that stimulates a person’s immune system to produce immunity to a specific disease, protecting the person from that disease. Vaccines are usually administered through needle injections but can also be administered by mouth or sprayed into the nose” (Centers for Disease Control and Prevention, 2018, para 1).

- Missed vaccination – A dose of vaccine that has not been administered by the appropriate time according to the CDC’s immunization schedule.
- Fully vaccinated – A child that has completed all recommended vaccines for their age according to the CDC’s immunization schedule.
- Under vaccinated – A child that has not completed all recommended vaccinations for their age according to the CDC’s immunization schedule.
- Provider – an individual who provides healthcare through decision making, after evaluation and treatment considerations.
- Parent – the biological, legal or other designated guardian who can give consent for treatment of the minor child.

### **Logic Model**

The following logic model outlines the inputs and activities that were used as well as outputs of the project. The short term, intermediate, and long-term effects are also included. If parents/guardians understand the importance of vaccinations they may be motivated to return for subsequent vaccinations, therefore increasing the number of children completing all recommended vaccinations before their second birthday and ultimately prevent outbreaks of vaccine preventable diseases.

**Figure 2**

*Logic Model*

Purpose or Mission: Assess barriers to vaccination in children under 2 in southeast Kansas					
INPUTS: trained staff, health information systems, screening tools, educational information. BARRIERS: limited clinic hours, availability of trained staff, parental attitudes	ACTIVITIES: review immunization records, identify children in need of vaccinations, assess and address barriers to vaccination	OUTPUTS: documentation of immunization records and barriers assessment	SHORT TERM OUTCOMES: parents increase in knowledge of risks and benefits of vaccination, increase in vaccinations, decreased missed opportunities	INTERMEDIATE OUTCOMES: increase in parents returning to complete vaccine series, continued increase in vaccination rates and decrease in missed opportunities	LONG TERM EFFECTS: increase in infants completing all recommended vaccines before age 2, prevent outbreaks of vaccine preventable diseases

**Summary**

Vaccination rates for children under the age of two at CHCSEK are below the goals set by Healthy People 2030, HEDIS, and the organization. This leaves many children in Southeast Kansas and Northeast Oklahoma susceptible to vaccine preventable diseases. A thorough assessment of barriers to vaccination may provide a better understanding of the factors influencing vaccination and allow for the development of vaccination programs tailored to the needs of families in Southeast Kansas and Northeast Oklahoma.

## **CHAPTER II**

### **Literature Review**

A systematic search of the literature was conducted using the Summons database with keywords vaccine, immunization, compliance, and infants. This search included full text articles published worldwide from 2014-2019 and written in English. Additionally, the reference lists of these articles were examined, and available relevant articles were also reviewed.

The factors that influence vaccine compliance in infants are the phenomena of interest in this literature review. Most studies available on this topic are quantitative in nature and involved pretest and posttest data and/or systematic chart review following interventions geared at increasing vaccination rates. Several studies were derived from the implementation of educational programs or quality improvement projects in a specific department and completed with small convenience samples, which may limit the generalizability.

The patient-provider relationship, parental attitudes, parental vaccine education programs, socioeconomic barriers, and the use of quality improvement and provider education programs were key concepts identified in the literature.



## **Patient-Provider Relationship**

Anderson and Arvidson (2017) conducted a study to determine if illness rates were related to vaccine status where parental attitudes toward vaccines were also examined. Parents were surveyed and compared with retroactive chart review for accuracy. There was no overall correlation found between illness and vaccine status. However, it was reported that the choice to vaccinate was directly related to following recommended guidelines and advice from healthcare providers. This further showed the influence health care providers have on parental decisions to vaccinate or not and the importance of developing trusting relationships. They suggested that “nurse practitioner practice implications relate directly to further education of parents, support, and trust building” (Anderson & Arvidson, 2017, p. 415).

Vaccine hesitancy has increased as parents are exposed to unreliable information from the internet and social media (Yaquib et al, 2014). According to Yaquib et al (2014), healthcare providers are finding difficulty establishing trusting relationships with patients, and mistrust of information is more evident than lack of information. However, it is not the vaccines that are mistrusted, it is the institutions behind them. The public mistrusts government, pharmaceutical companies, and vaccine manufacturers. Therefore, it is suggested that establishing trust with patients is imperative and legitimacy is necessary to influence positive behaviors (Yaquib et al, 2014). Changes in culture are noted, implying that modern society prefers individual empowerment and choice rather than generalized recommendations and guidelines in healthcare (Yaquib et al, 2014). More frequently medical choices are made based on personal situation and not the greater good for the community, which also indicates the need to develop relationships. Knowing each

patient's unique situation allows the provider to tailor education for the individual (Yaqub et al, 2014).

However, a much larger study by Glanz et al (2013), found that children who have been under vaccinated by parental choice, utilize healthcare less often than vaccinated children. Glanz et al (2013) hypothesized this to be related to parents' mistrust of medical professionals and use of alternative medicine. The large retroactive cohort study of 323,247 participants was designed to compare the use of healthcare between fully vaccinated and under vaccinated children under age two. It involved reviews of healthcare utilization of children enrolled in an insurance HMO. Of the participants, 49% were found to be under vaccinated, which is much lower than the national average of 79.5% (National Committee on Quality Assurance, 2020). This study did not examine the socioeconomic status of participants as it only included those with insurance. This is interesting because lack of access to care has been linked with lower vaccination rates (Trojanowski et al., 2019) and this seems to contrast with Glanz et al (2013). This study also contrasts with the studies done by Yaqub et al. (2014) and Anderson and Arvidson (2017) regarding provider trust and leads one to question the feelings and attitudes of parents who are not utilizing traditional medical care.

### **Parental Attitudes**

According to Yaqub et al. (2014), there is little information available on parental vaccine hesitancy, therefore making it difficult to find what causes these attitudes and how to change them. Ebby (2017) attempted to study this phenomenon by screening for vaccine hesitancy and formulating an educational program. The program was designed to counteract popular misinformation regarding vaccines via voice over power point, but

specific information about what myths were addressed in the intervention were not published. Their goal was to provide brief office visit education to parents and decrease the number of infants following alternative vaccine schedules and therefore increase the number of infants that are fully vaccinated according to the CDC. Unfortunately, the low sample size (n=23) only identified one vaccine hesitant family. Therefore no comparison group was available and the 22 other participants followed the recommended vaccine schedule. However, the Parental Attitude about Childhood Vaccine (PACV) survey was noted to be a valid survey for identifying vaccine hesitancy (Ebby, 2017).

According to Glanz et al. (2015), government agencies, pharmaceutical companies, and vaccine manufacturers are not trusted by vaccine hesitant parents, and providing parents with this type of research information may cause an increase in hesitancy. Parents have requested balance and equal talk of benefits and risks of vaccines, stating when only benefits are presented, they feel like information is being withheld. Glanz et al. (2015), suggested that when talking with vaccine hesitant parents, keep in mind they are also trying to do the best for their children. Providers should continue to build trust with parents, inform of risks, reduce concerns about unfounded risk, and educate how the immunization schedule is in the best interest of the community, including their children. Glanz et al., 2015, suggests that future studies should address how to provide parents with thoughtful, individualized, evidence-based information.

### **Parental Education Programs**

In a pretest/posttest study by Burke et al. (2019), an educational program was implemented to provide urban prekindergarten parents/guardians with education about the influenza virus, influenza vaccine, and the community's resources. Parents agreed

with the flu vaccine 64% pretest and 75% posttest, knowledge of where to get the flu vaccine was 65% pretest and 83% posttest and lack of insurance was listed as a barrier 71% of the time on the pretest and 25% on the posttest. The most dramatic change was the decrease in participants that identified lack of insurance as a barrier. However, although vaccines are freely available, some parents still chose not to vaccinate their children due to concerns for safety and necessity. “Moving forward, assessing the reasons why caregivers do not agree with the influenza vaccine, may prove crucial in tailoring the education program to address these reasons” (Burke et al., 2019, p. 555).

Papachrisanthou et al. (2016), conducted a study to compare vaccine education using a visually enhanced education (VEE) program to usual care (UC) with verbal education among infants of low-income parents. The VEE included 5 pictures of children with visible symptoms of vaccine preventable diseases, verbal education was provided, and questions answered while parents viewed the pictures. The VEE program lasted anywhere between 5-15 minutes. Visual education was provided at the newborn and one month visit before seeing the provider. “By 7 months of age (218 days old), 68% of those in the VEE group compared with 33% of the UC group were fully immunized for all 3 sets of immunizations” (Papachrisanthou et al., 2016, p. 306). This study suggested that parental immunization education should include information on how failure to vaccinate poses the greatest risk to children. This also reinforces the ideas of Glanz et al. (2015), parents should be taught that the suggested immunization schedule is the best for everyone, including their children. “Vaccine hesitancy can be impacted by reducing complacency, improving convenience, and increasing confidence...One of the

most effective tools to overcome vaccine hesitancy is proper provider communication” (Papachrisanthou et al., 2016, p. 308).

### **Socioeconomic Barriers**

Understanding parental perceptions and barriers to vaccination are important in providing appropriate education (Trojanowski et al., 2019). In an editorial by Trojanowski et al. (2019), several barriers to vaccination were identified including missed well-child visits due to unemployment, low socioeconomic standing, busy single-parent household, or inconvenient office hours.

In a randomized control study by Niderhauser et al. (2018), barriers to immunizations were examined using the Searching for Hardships and Obstacles to Shots (SHOTS) survey to see if there were significant changes in barriers from birth to 7 months. Several barriers were identified that decreased over time including parental knowledge of immunization timing, where to get immunizations, lack of appointment availability, inconvenience of clinic hours, lack of childcare for other children, and child illness. These were thought to decrease as parents learned how to navigate the healthcare system. This is significant as it suggested the need for health care providers to begin parental education early, in the prenatal period if possible, regarding not only vaccine schedules and safety, but when, where, and how vaccines are available. It is also pertinent to continually assess concerns and provide vaccine education throughout infancy. Unfortunately, parental attitude toward the importance of vaccines decreased over time and concerns about shots increased in over half of participants. Concerns included fear of side effects, unknown safety, the number of vaccines administered, vaccine ingredients,

and effects on immune system. However, there was no overall change in the immunization rate of infants due to these barriers.

### **Quality Improvement Programs**

A study was done by Greer (2016), to evaluate a quality improvement system to increase vaccination in an outpatient pediatric nephrology clinic. Participants in the study were aged 14 years and younger. Vaccine records were reviewed on admission and annually thereafter to identify patients in need of immunizations. With this very simple intervention pneumococcal vaccination increased from 71-100%, HPV vaccination increased from 67% in females only to 85% in both genders, and influenza vaccine increased to 100% compliance. This study was limited to a very specialized population, but it shows how the use of a simple intervention, obtaining and reviewing immunization records, can make a very large impact on vaccine compliance in the outpatient setting. This can be easily adapted to broader areas and quality assessment programs should be in place to assure vaccination records are being reviewed. (Greer, 2016, p. 33)

In a study by Duvall (2019), the functions of the electronic health record (EHR) were utilized in a quality improvement project to increase influenza vaccination in an inpatient pediatric hematology/oncology unit. Interventions included the use of a vaccine screening tool and an automated physician notification to order a flu vaccine built into the EHR. “The rate of influenza vaccination administration pre-intervention was 5.88%...the rate of influenza vaccination administration on the inpatient hematology/oncology post-intervention was 43.9%” (Duvall, 2019, p. 150). The success of the interventions was credited to an inter-professional approach, collaboration between physicians, nurses, pharmacy, and IT staff. The success of this intervention is very notable; however, the

vaccine rate of 43.9% is still low, compared to the national average of 53.9% in the 2015-2016 flu season. The study by Duvall et al (2019) was also limited to a very specialized and immunosuppressed population, which could skew this rate.

Both of the afore mentioned quality improvement projects were able to increase vaccination rates exponentially indicating the importance of obtaining and reviewing vaccination records and screening for needed immunizations. Again, both were limited to very specialized groups, however, the overall concepts could be applied to a more generalized population.

### **Healthcare Provider Education**

The study by Yaqub et al. (2014), reviewed above, also included barriers identified by healthcare providers, including lack of time, lack of vaccine knowledge, and personal uncertainty, and lack of concern with regards to contracting disease for themselves and patients. This highlighted the need for education for both parents and healthcare providers regarding vaccine benefits.

A qualitative research study was done in New Zealand by Taylor et al. (2015) to identify successful strategies used in primary care clinics with high immunization rates, which was defined as at least 90% compliance at age two. A very broad and diverse sampling area was selected, with special attention to include areas of low socioeconomic status. A total of 23 clinics were selected and interviews conducted with a nurse providing immunizations at each practice. According to Taylor et al (2017), providing immunizations was a top priority at all locations and staff were “passionately committed to immunization.” (p. 25) This was also demonstrated by the commitment of staff members to be vaccinated themselves. Staff training and continuing education was also a

priority. They identified that providers building connections with patients in the prenatal period and early infancy was key to providing meaningful education. The clinics also used a systematic approach to identify patients needing immunizations. Immunization records were reviewed via an immunization registry prior to office visits, patients received reminder calls before appointments, and if appointments were missed, they were contacted to reschedule. The next appointment was also made before patients left the clinic. Missed appointments were identified as a challenge and staff were committed to reaching patients. Many of the clinics attempted to decrease barriers by providing transportation and referral to outreach services if necessary. The group noted that setting immunization targets and monitoring staff performance helped keep staff motivated and passionate about their work (Taylor et al., 2017, p. 25).

### **Summary**

Although vaccines have been long proven to be safe and effective at preventing many childhood diseases, a significant number of children are still not vaccinated for various reasons. Some parents make a conscious decision not to vaccinate their children, some are unsure of the importance of vaccines, and others do not know how or have difficulty obtaining them. Ebby (2017) identified the Parent Attitude about Childhood Vaccine (PAVC) survey as valid tool to assess vaccine hesitancy (p. 23). The Searching for Hardships and Obstacles to Shots (SHOTS) survey is another valid tool used to assess hesitancy and socioeconomic barriers (Niderhauser et al., 2018).

One very common theme throughout these studies was the effect of the patient-provider relationship on the willingness of parents to accept vaccination for their children. Healthcare providers were noted numerous times to be one of the most trusted



sources of vaccine information. Providers begin developing relationships in the antenatal and early post-natal period (Taylor et al., 2017, p. 25), during a time when parents begin to make to vaccination decisions (Ebby, 2017, p. 23) and may also begin vaccine hesitancy (Glanz et al, 2015). These relationships become very important as developing trust and providing unbiased education can improve vaccine compliance. (Trojanowski et al, 2019, p. 450). According to Papachrisanthou et al (2016), “One of the most effective tools to overcome vaccine hesitancy is proper provider communication” (p. 308). According to Trojanowski et al. (2019), “Nurses are uniquely equipped to influence positive health behavior change because of the high degree of trust afforded to our profession” (p. 450).

There are few statistics available on parental vaccine hesitancy, giving little information on what causes these attitudes and how to change them (Yaqub et al., 2014). Future studies should address how to provide parents with thoughtful, individualized, evidence-based information. Most of the literature found was conducted on small samples in individual specialized clinics, hospitals, or departments with potential to be generalized. Larger, more generalized research is necessary to determine universal factors effecting vaccination and the interventions necessary to increase compliance.

## **CHAPTER III**

### **Methodology**

#### **Objectives**

The purpose of this scholarly project was to identify barriers to vaccination, including vaccine hesitancy and socioeconomic barriers affecting completion of the primary vaccine series, or combo 10, in children under age two. Despite the proven success of immunizations, many children remain unvaccinated or only partially vaccinated, and many parents choose to delay or refuse immunizations for their children (Papachrisanthou et al., 2016, p. 304). A thorough assessment of barriers to vaccination may provide a better understanding of the factors influencing vaccination and allow for the development of vaccination programs tailored to the needs of families in southeast Kansas.

#### **Project Design**

This descriptive study used a validated questionnaire, the Searching for Hardships and Obstacles to Shots (SHOTS) survey (Niederhauser et al, 2019), to gather information about parental attitudes toward vaccination and socioeconomic barriers affecting vaccination rates in children under the age of two at Community Health Center of Southeast Kansas (CHCSEK), a Federally Qualified Health Center (FQHC) in rural Southeast Kansas and Northeast Oklahoma. All parents/guardians of children under two

presenting to CHCSEK in Pittsburg, Kansas for an office visit between December 6, 2021 and January 28, 2022 were asked to complete the SHOTS survey.

### **Sample**

The setting for this project was a large FQHC providing primary care through family practice and pediatric clinics and acute/sick visits through an attached walk-in clinic in Pittsburg, Kansas. A convenience sample was taken from parents/guardians of children under two presenting to any of these clinics for any type of office visit. Previous research and observation have determined that children who are compliant with well child visits are more likely to be up to date on vaccinations (Glanz et al, 2013; Trojanowski et al., 2019). Therefore, children presenting for sick visits to both primary care and walk-in clinic were included in this study to gain an accurate representation of the patient population. The focus of this study was on the primary vaccination series, therefore, parents/guardians without children under age two were excluded from the study.

### **Recruitment**

The goal was to recruit as many eligible participants as possible from the target population. Parent/guardians of children under two were recruited by participating clinic registration and nursing staff. All participating parents/guardians were recruited according to the inclusion and exclusion criteria established for the project. Participation in the project was on a voluntary basis, and no compensation was provided to any participants.

## **Instruments**

With permission from its author, Victoria Niederhauser PhD, RN, FAAN, the SHOTS survey was used as a validated tool to assess vaccine hesitancy and socioeconomic barriers affecting vaccination rates at this clinic. The survey contains 23 items with three subscales assessing access to shots, importance of shots, and concerns about shots. “Each item is rated on an ordinal scale from 0 to 4 reflecting the degree to which the item is considered a problem for parents or primary caregivers related to childhood immunizations” (Niederhauser, 2021, para 2). The survey is appropriate to be self-administered or used in interview format and no special training required was required to administer the survey.

## **Procedure**

Collaboration from multiple parties was essential to the completion of this project, including CHCSEK’s administrative approval committee and registration and nursing staff in multiple departments. This project relied heavily on nursing staff for successful completion. Survey data was collected from December 6, 2021, to January 28, 2022 in all departments of CHCSEK’s Pittsburg location including family practice, pediatric, and walk-in clinics.

Parents/guardians who were eligible for the study were identified by participating registration and nursing staff through reviewing scheduled patients. Surveys were given to the parent/guardian of any child under the age of two at check in by either the registration or nursing staff. Surveys and consents were collected by the nursing staff and placed anonymously in a designated folder. When nursing staff identified that a survey

was completed, a note was placed in the child's electronic medical record so that the survey was not duplicated at future office visits.

### **Protection of Human Subjects**

Approval from both CHCSEK, Pittsburg State University internal review board (IRB), and the Irene Ransom Bradley School of Nursing was obtained before any data was collected for this project. Adherence to criteria for including human subjects set forth by Pittsburg State University and CHCSEK was upheld throughout the study.

Participation in this study was voluntary and no personal information was obtained. No identifying information was collected on any surveys aside from demographic information including age of parent, race, ethnicity, education level, insurance status and child's reported vaccination status. All data collected was kept confidential by the project-participating nursing staff until obtained by the primary investigator. Following the completion of the study, all collected surveys and questionnaires were destroyed through a shredding process by the primary investigator.

### **Evaluation Plan**

Once all surveys were completed, response frequency and mean response were calculated for each item. Items were also totaled to obtain a composite score for each subscale, access to shots, importance of shots, and concerns about shots. The higher the score the more barriers to vaccination are present. Means for each subscale were also calculated for comparison. The response frequency, mean response, subscale composite scores, and means for each subscale were entered into a spreadsheet, analyzed, and presented in tables to illustrate the different potential barriers to vaccination and which are most problematic in Southeast Kansas.

## **Limitations**

Although this study was designed to include the parents/guardians of all children under the age of two presenting to the clinic, it may have been limited by parents/guardians who declined to complete the survey and by participants that were not identified by registration or nursing staff as being eligible for the project.

Parents/guardians were asked to complete a large amount of paperwork as part of the check-in process, which may have deterred parents/guardians from completing the survey. This is also a very busy primary care clinic with appointments changing throughout the day; therefore, time constraints may have been an issue for staff leading to difficulty in identifying and assisting parents/guardians with survey completion. These factors may have limited the data collected for the project. This clinic serves a large Hispanic population; however, the SHOTS survey is only available in English, and lack of interpreters for Spanish speaking patients was also a limitation of this study.

## **Summary**

This chapter discussed in detail the project design, target population, and procedure for data collection for this scholarly project. Using the SHOTS survey, a thorough assessment of barriers to vaccination may provide a better understanding of barriers to vaccination, including vaccine hesitancy and socioeconomic barriers affecting completion of the primary vaccine series, or combo 10, in children under age two, allowing for the development of vaccination programs tailored to the needs of families in Southeast Kansas.

## CHAPTER IV

### Evaluation Results

#### **Purpose**

The purpose of this scholarly project was to identify barriers to vaccination, including vaccine hesitancy and socioeconomic barriers affecting completion of the primary vaccine series, or combo 10, in children under age two. The key project questions are the following: What are the primary factors influencing vaccination? Are there barriers to vaccination, including vaccine hesitancy or socioeconomic barriers that are keeping children under age two from completing the combo 10 primary vaccine series in Southeast Kansas?

#### ***Research Questions***

1. Does the parent/guardian have a knowledge deficit regarding vaccine preventable diseases?
2. Does the parent/guardian have knowledge deficit of the recommended well child check and vaccination schedule?
3. Does the parent/guardian know where to obtain vaccinations?
4. What are the barriers for parents/guardians of children under two to obtaining vaccinations for their child?
5. What are parent/guardian concerns about recommended vaccines?

This descriptive study used a validated questionnaire, the Searching for Hardships and Obstacles to Shots (SHOTS) survey (Niederhauser et al, 2019), to gather information about parental attitudes toward vaccination and socioeconomic barriers affecting vaccination rates in children under the age of two at Community Health Center of Southeast Kansas (CHCSEK), a Federally Qualified Health Center (FQHC) in rural Southeast Kansas.

### **Description of Sample**

There were 82 participants who completed the survey in the eight week period from December 6, 2021-January 28, 2022. The demographic survey was designed for the parent/guardian completing the survey, however, participants had difficulty with the demographic questionnaire and 30 participants answered with the child's age instead of the parent/guardian's age. It is unknown if other questions regarding gender, race, education, and health insurance were answered appropriately, therefore, demographic information will not be reported.

A question regarding the child's vaccination status was included in the demographic survey. The question asked parents/guardians to describe their child's vaccination status as fully vaccinated (had received all recommended vaccinations for age), partially vaccinated (had received some vaccinations), or not vaccinated (had received no vaccinations) to the best of their knowledge. Parents reported that 77% (n=63) children were fully vaccinated and 20% (n=16) were at least partially vaccinated. One participant reported receiving no vaccinations and two failed to answer the question. Table 1 shows the number and percentage of reported vaccination status.



**Table 1**

*Demographic Data*

Reported Vaccination Status	n = 82	%
Fully immunized	63	77%
Partially immunized	16	20%
Not immunized	1	1%
No answer	2	2%

**Survey Results**

The SHOTS survey contains 23 items with three subscales assessing access to shots, importance of shots, and concerns about shots. Each item was rated on an ordinal scale from 0 to 4, with 0 being “not a problem at all” to 4 being a “very big problem”. Table 2 shows the frequency of numerical responses (0 to 4) to each of the 23 questions as well as the mean response for each question, indicating how problematic each question is for the selected population.

To obtain subscale composite scores all items in each subscale are added together. “The access to shots subscale includes items #1-12 and the range is 0-48. The concerns about shots subscale includes items #13, 15, 16, 19, 21, 22 and the range is 0-24. The importance of shots subscale includes items # 14, 17, 18, 20, 23 and the range is 0-20” (Neiderhauser, 2019). Each subscale has a different number of questions, 12 questions in access to shots, 6 questions in concerns about shots, and 5 questions in importance of shots. Mean response was obtained by dividing the composite score by the number of questions for that subscale. Table 3 shows the mean composite score and mean response

for each subscale, comparing subscales and which area is most problematic. The higher the mean the more significance for vaccine hesitancy.

**Table 2**

*SHOTS Survey Data*

Question	Response (n) 0	1	2	3	4	Mean
1. I didn't know when my child needed to get his/her shots	69	6	4	0	3	0.33
2. I didn't know where to take my child to get his/her shots	78	1	0	1	2	0.17
3. There were no appointments available at the clinic for shots	75	1	3	1	2	0.26
4. The shots cost too much	75	3	2	1	1	0.22
5. The clinic/facility wasn't open at a time I could go	77	1	2	1	1	0.21
6. I didn't have a ride to the clinic	74	1	3	2	2	0.33
7. I didn't have someone to take care of my other children	72	1	3	6	0	0.39
8. My child was sick and could not get his/her shots	67	7	6	0	2	0.43
9. The clinic wait was too long	71	1	8	1	1	0.40
10. I couldn't get time off from work	64	2	8	3	5	0.70
11. Getting my child in for shots is too much trouble	72	5	2	0	3	0.39
12. I just forgot	63	12	3	0	4	0.56

13. I'm scared of the side effects of the shots	59	11	5	3	4	0.72
14. I don't believe in getting kids shots	71	4	1	0	6	0.54
15. I worry about the number of shots my child gets at one time	58	10	8	5	1	0.73
16. I worry about what is in the shots	57	10	6	6	3	0.83
17. I don't think keeping my child up to date on shots is important	70	2	1	1	8	0.68
18. I don't think the shots work to prevent diseases	67	7	1	1	6	0.66
19. I worry my child might get sick from the shot	54	13	9	3	3	0.87
20. My health care provider told me NOT to get my child his/her shots	74	0	0	0	8	0.63
21. If something bad happened to my child after a shot, I would feel like it was my fault	45	12	9	3	13	1.4
22. I worry about how safe shots are	53	13	8	1	7	1.0
23. I don't think kids shots are important	68	5	0	1	8	0.77

**Table 3**

*Subscale Data*

Subscale	Total Questions in Subscale	Composite Score	Mean
Access to Shots	12	3.4	0.29
Concerns about Shots	6	4.2	0.70
Importance of Shots	5	2.2	0.43

Concerns about shots was the most problematic for this cohort (mean 0.70), followed by importance of shots (mean 0.43), then access to shots (mean 0.29). The concerns about shots subscale contains six items, all of which scored within the seven most problematic items for parents/guardians. The top four items were from the concerns about shots subscale, including: “If something bad happened to my child after a shot, I would feel like it was my fault” (mean 1.4), “I worry about how safe shots are” (mean 1.0), “I worry my child might get sick from the shot,” (mean 0.87), and “I worry about what is in the shots” (mean 0.83). The next (5<sup>th</sup>) most problematic question was from the importance to shots subscale: “I don’t think kid’s shots are important” (mean 0.77). The remaining questions from the concerns about shots subscale, “I worry about the number of shots my child gets at one time” (mean 0.73) and “I’m scared of the side effects of the shots” (mean 0.72) were also most problematic for this population.

**Analysis of Project Questions**

***Research Question 1***

Does the parent/guardian have a knowledge deficit regarding vaccine preventable diseases? This question was answered by responses in the importance of shots subscale,

including items # 14, 17, 18, 20, 23. Comparatively, importance of shots (mean 0.43) was less problematic than concerns about shots (mean 0.70), but more problematic than access to shots (mean 0.29) in this population. Most notable are item # 17, “I don’t think keeping my child up to date on shots is important (mean 0.68), item # 18, “I don’t think the shots work to prevent diseases” (mean 0.66) and item # 23, “I don’t think kid’s shots are important” (mean 0.77). Parent/guardian’s report that vaccines are not important and do not work to prevent disease indicates a knowledge deficit in vaccine preventable diseases.

### ***Research Question 2***

Does the parent/guardian have knowledge deficit of the recommended well child check and vaccination schedule? Item #1, “I didn’t know when my child needed to get his/her shots” (mean 0.33), was part of the access to shots subscale and assessed knowledge of the recommended vaccine schedule. This item ranked 19<sup>th</sup> of the 23 items, making knowledge deficit of the recommended vaccine schedule one of the least problematic items to parents/guardians.

### ***Research Question 3***

Does the parent/guardian know where to obtain vaccinations? Item # 2, “I didn’t know where to take my child to get his/her shots” (mean 0.17), was also part of the access to shots subscale and assessed knowledge of where to obtain vaccines. This item has the lowest reported mean of all 23 items indicating that knowledge of where to obtain vaccinations is least problematic for parents/guardians.

#### ***Research Question 4***

What are the barriers for parents/guardians of children under two to obtaining vaccinations for their child? This question was answered by responses to the access to shots subscale, which includes items # 1-12. Access to shots (mean 0.29) was the least problematic for this population, indicating few socioeconomic barriers to vaccination. The most notable socioeconomic barrier was item #10, caregivers' inability to get off work (mean 0.70). However, item # 5, clinic hours (mean 0.21) and item # 3, inability to make an appointment (mean 0.26) were not highly problematic.

#### ***Research Question 5***

What are parent/guardian concerns about recommended vaccines? This question was answered by the concerns about shots subscale, which includes items #13, 15, 16, 19, 21, 22. Concerns about shots was the most problematic for this population (mean 0.70). Parents/guardians reported that they were concerned about the safety (mean 1.0), ingredients (mean 0.83) and side effects (mean 0.72) of vaccines. They worry that vaccines may make their child sick (mean 0.87) and if something bad happened to their child they would feel like it was their fault (mean 1.4). They were also concerned about the number of vaccines given at one time (mean 0.73). Of the six questions in the concerns about shots subscale, all were comparatively problematic for parents/guardians of children under two, indicating concerns about vaccines as the primary barrier to vaccination for this project.

#### **Summary**

This project identified that concerns about vaccines is the most problematic of the barriers that were assessed by the SHOTS survey. Socioeconomic barriers and access to

shots were less problematic for parents/guardians. Concerns about vaccination may lead to vaccine hesitancy and affect the percentage of children completing the recommended combo 10 primary vaccine series before their second birthday. Despite reports of concern about vaccines, demographic data indicate that 77% children in this population are fully vaccinated to the knowledge of the parent/guardian, therefore parents/guardians are not choosing to withhold vaccines due to their concerns. This implies that there are likely other factors that are contributing low vaccination rates.

## **CHAPTER V**

### **Discussion**

#### **Relationship of Outcomes to Research**

##### ***Research Question 1***

Does the parent/guardian have a knowledge deficit regarding vaccine preventable diseases? Parent/guardians report that vaccines are not important and do not work to prevent disease indicates a knowledge deficit in vaccine preventable diseases. This supports previous research indicating that parents are not sure that vaccines are necessary or the best choice for their children (Glanz et al, 2015). In the study by Neiderhauser (2019) using the SHOTS survey, caregivers also reported that vaccines were not important and the importance of vaccines decreased over time. This project supports these findings and indicates the need for continued assessment of vaccine hesitancy and vaccine education.

##### ***Research Question 2***

Does the parent/guardian have knowledge deficit of the recommended well child check and vaccination schedule? Parent/guardians reported knowledge deficit of the recommended vaccine schedule to be one of the least problematic items in the SHOTS survey. This is interesting as previous research and observation determined children who are compliant with well child visits are more likely to be up to date on vaccinations



(Glanz et al, 2013; Trojanowski et al., 2019) and it was previously thought that a knowledge deficit of the recommended well child check and vaccination schedule could be contributing to low vaccination rates. Survey responses indicate this is not the case for this population. The combo 10 primary vaccination series include two doses of the seasonal influenza vaccine, which is recommended but not required for daycare/kindergarten entry. Therefore, parents may not think it is part of the vaccination schedule and further research is needed to assess parent's knowledge of vaccine recommendations.

### ***Research Question 3***

Does the parent/guardian know where to obtain vaccinations? Knowledge of where to obtain vaccinations was the least problematic for parents/guardians. This is not surprising as access to care, including immunizations, has and continues to be a priority at CHCSEK. This is also consistent with research by Neiderhauser (2019) using the SHOTS survey, where knowledge of where to obtain vaccinations was not a significant barrier to vaccination and decreased over time as parents learned how to navigate the healthcare system.

### ***Research Question 4***

What are the barriers for parents/guardians of children under two to obtaining vaccinations for their child? Socioeconomic barriers assessed by the access to shots subscale were least problematic, indicating that parents have little difficulty in obtaining immunizations for their children. This is not surprising as access to care, including immunizations, has and continues to be a priority at CHCSEK. This is consistent with the literature review as organizations that are committed to providing immunizations were

more likely to have high vaccination rates. This is also consistent with research by Neiderhauser (2019) using the SHOTS survey, where access to shots was less problematic than concerns about shots and importance of shots.

Continuing education for staff, the use of a systemic approach to identify patients needing immunizations, encouraging patients to keep wellness and immunization appointments, providing parents with education on immunizations, and offering outreach and transportation services are ways to prioritize vaccine compliance (Taylor et al, 2017, p. 25). These are all strategies used at CHCSEK which likely contribute to the lack of socioeconomic barriers for this population.

### ***Research Question 5***

What are parent/guardian concerns about recommended vaccines? Concerns about shots was the most problematic of the barriers assessed by this survey. This is consistent with previous research that vaccine hesitancy is increasing due to parents' mistrust of government agencies and vaccine manufacturers (Burke et al, 2019, Glanz et al, 2013, and Yaqub et al, 2014). In a study by Neiderhauser (2019) using the SHOTS survey, concerns about shots increased through infancy in over half of participants. Like this project, concerns included fear of side effects, unknown safety, the number of vaccines administered, vaccine ingredients, and effects on immune system. However, also like this project, Neiderhauser (2019) found no overall change in the immunization rate due to these concerns.

### **Observations**

Despite reports of concern about vaccines, demographic data indicate that 77% children in this population are fully vaccinated to the knowledge of the parent/guardian,

therefore parents/guardians are not choosing to withhold vaccines due to their concerns. This reported vaccination rate is above the national average of 68-75% for the completion of the combo 7 vaccines needed for daycare and kindergarten entry (National Committee on Quality Assurance, 2022), but is much higher than CHCSEK's vaccination rate of 37% for combo 10 and 57% with flu vaccine excluded. Discrepancies between these vaccination rates requires further investigation of other factors that may be contributing to low vaccine compliance.

### **Limitations**

One possibility for discrepancy in vaccination rates and a limitation of this project is the reporting of combo 10 compliance at CHCSEK. All patients under the age of two that are seen at the clinic regardless of visit type, reason, or primary care provider are included in the reporting of combo 10 completion. Therefore, patients that are seen once or intermittently for acute reasons and have an outside primary care provider managing their vaccinations are included in the quality measure. Since these patients may be fully vaccinated, but vaccination records are unavailable, this may skew the facility's vaccination rate, leading to an inaccurately low vaccination rate at CHCSEK.

Parent's understanding of the vaccination schedule and recommended vaccinations may also be a limitation of this project. The combo 10 includes two doses of the seasonal influenza vaccine, which is recommended but not required for daycare/kindergarten entry. Parents reported that 77% of children had received all recommended vaccinations, but parents may not think that this includes the seasonal flu vaccine, leading to an inaccurately high reported vaccination rate.

Convenience sampling may limit the generalizability of the findings. The sample population was recruited from CHCSEK's main clinic in Pittsburg, KS, but reporting of vaccine compliance comes from the entire organization that has 17 clinics across Southeast Kansas and Northeast Oklahoma and compliance rates may differ between clinic locations and demographics. In attempt to gain an accurate representation of the patient population, children presenting to both primary care and walk-in clinic for both acute and sick visits were included, but most surveys in this study were obtained from the primary care pediatric clinic at CHCSEK. The pediatric clinic is also staffed by three pediatricians who are highly committed to vaccine education and compliance. Previous research and observation have also determined that children who are compliant with well child visits are more likely to be up to date on vaccinations (Glanz et al, 2013; Trojanowski et al., 2019). These factors may have also led to an unexpectantly high reported vaccination rate in the sample compared to all CHCSEK clinics.

### **Evaluation of Theoretical Framework**

Pender's Health Promotion Model assumes that health care providers are part of the individual's interpersonal environment, exerting influence on experience and personal factors (Petiprin, 2020). This model demonstrates how providers can exert influence on health behavior and decision making related to vaccination. This project identified that parents/guardians are concerned about immunizations, but further research is needed to determine if there is a specific vaccine that is concerning, influenza for example, that is affecting vaccination rates and how providers influence vaccination decisions.

### **Evaluation of Logic Model**

The logic model for this project assumes that if parents/guardians understand the importance of vaccinations they may be motivated to return for subsequent vaccinations, therefore increasing the number of children completing all recommended vaccinations before their second birthday and ultimately prevent outbreaks of vaccine preventable diseases. The data from the SHOTS survey in this study indicate there is a knowledge deficit about the importance of vaccines and concerns about vaccines. Incorporating ways to address both the importance of vaccines and concerns about vaccines in patient education may be beneficial in increasing the rate of children completing the combo 10 vaccine series before their second birthday.

### **Implications for Future Projects and/or Research**

This study identified that parents/guardians have concerns about vaccines, but further research is needed to determine the extent to which this is affecting vaccination rates and if there is a specific vaccine that is concerning, influenza for example. If this study were to be repeated, asking parents if specific vaccines were concerning and to elaborate on their concerns would be beneficial. This may further allow for development of individualized vaccine education. Further research is also needed to determine how providers influence vaccination decisions and determine how vaccine education may affect compliance.

### **Implications for Practice**

Vaccine hesitancy is increasing (Burke et al, 2019; Glanz et al, 2013; Yaqub et al, 2014) and parents are not sure that vaccines are necessary and the best choice for their children (Glanz et al, 2015). This project identified concerns about shots and vaccine hesitancy in parents/guardians of children under two in Southeast Kansas. Although

further research is needed to determine if and how vaccine hesitancy is affecting vaccination rates at CHCSEK, previous research suggest that the patient-provider relationship and vaccine education can positively influence vaccine decision making.

Niderhauser et al. (2018), suggest that health care providers begin parental vaccine education early, in the prenatal period if possible, regarding not only vaccine schedules and safety, but when, where, and how vaccines are available. It is also pertinent to continually assess concerns and provide vaccine education throughout infancy. The organization should remain committed to providing continuing education for staff, the use of a systemic approach to identify patients needing immunizations, encouraging patients to keep wellness and immunization appointments, providing parents with education on immunizations, and offering outreach and transportation services as ways to prioritize immunization compliance and reduce socioeconomic barriers to vaccination (Taylor et al, 2017, p. 25).

Healthcare providers should also be committed to providing vaccines and vaccination education. Parental immunization education should include information on how failure to vaccinate poses the greatest risk to children (Papachrisanthou et al, 2016, p. 306) and the suggested immunization schedule is the best for everyone, including their children (Glanz et al, 2015). “Vaccine hesitancy can be impacted by reducing complacency, improving convenience, and increasing confidence...One of the most effective tools to overcome vaccine hesitancy is proper provider communication” (Papachrisanthou et al., 2016, p. 308).

## **Conclusion**

The purpose of this scholarly project was to identify barriers to vaccination, including vaccine hesitancy and socioeconomic barriers affecting completion of the primary vaccine series, or combo 10, in children under age two in Southeast Kansas. This project identified that concerns about vaccines is the most problematic of the barriers that were assessed by the SHOTS survey in this study. Concerns about vaccines and vaccine hesitancy can be positively influenced by patient-provider relationships and personalized vaccine education. Socioeconomic barriers and access to shots were less problematic for parents/guardians. There is discrepancy between measured vaccination rates and reported vaccination rates that requires further investigation of factors that may be contributing to low vaccination rates.

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## **APPENDIX**

## Appendix A

### Demographic Survey

Please answer the following demographic questions. Please note that no personal identifying information will be collected and all answers will be kept completely confidential.

1. Age (in years): \_\_\_\_\_
2. Gender (select one):
  - a. Female
  - b. Male
  - c. Nonbinary
  - d. Other (please specify) \_\_\_\_\_
  - e. Prefer not to respond
3. Which of the following best describes your racial/ethnic identity? (Select all that apply)
  - a. African American or Black
  - b. American Indian or Native Alaskan
  - c. Asian or Pacific Islander
  - d. Hispanic or Latino
  - e. White or Caucasian
  - f. Other (please specify) \_\_\_\_\_
4. What is your highest level of education?
  - a. Less than high school
  - b. High school graduate
  - c. Vocational training/Technical school
  - d. Some college
  - e. Bachelor's Degree
  - f. Advanced Degree
5. Which of the following best describes who you receive health insurance from?
  - a. Public insurance (Medicare, Medicaid, other public insurance)
  - b. Private insurance (Employer sponsored, Individual plans)
  - c. Uninsured
  - d. Other (please specify) \_\_\_\_\_
6. To the best of your knowledge, which of the following best describes your child's vaccination status?
  - a. Fully immunized (has received all vaccinations for age)
  - b. Partially immunized (has received some vaccinations)
  - c. Not immunized (has received no vaccinations)
  - d. Other (please specify) \_\_\_\_\_

## Appendix B

### Searching for Hardships and Obstacles to Shots (SHOTS) Survey

VPN © 2008

Below is a list of things that may cause problems for parents getting their children shots. On a scale of 0 to 4, with 0 being "not a problem at all" to 4 being a "very big problem", please CIRCLE your answers. NOTE: In this survey "clinic" refers to the place you get your child his or her shots.

1. I didn't know when my child needed to get his/her shots.....0.....1.....2.....3.....4
2. I didn't know where to take my child to get his/her shots.....0.....1.....2.....3.....4
3. There were no appointments available at the clinic for shots.....0.....1.....2.....3.....4
4. The shots cost too much.....0.....1.....2.....3.....4
5. The clinic/facility wasn't open at a time I could go.....0.....1.....2.....3.....4
6. I didn't have a ride to the clinic .....0.....1.....2.....3.....4
7. I didn't have someone to take care of my other children.....0.....1.....2.....3.....4
8. My child was sick and could not get his/her shots.....0.....1.....2.....3.....4
9. The clinic wait was too long.....0.....1.....2.....3.....4
10. I couldn't get time off from work.....0.....1.....2.....3.....4
11. Getting my child in for shots is too much trouble.....0.....1.....2.....3.....4
12. I just forgot .....0.....1.....2.....3.....4
13. I'm scared of the side effects of the shots.....0.....1.....2.....3.....4
14. I don't believe in getting kids shots.....0.....1.....2.....3.....4
15. I worry about the number of shots my child gets at one time.....0.....1.....2.....3.....4
16. I worry about what is in the shots.....0.....1.....2.....3.....4
17. I don't think keeping my child up-to-date on shots is important...0.....1.....2.....3.....4
18. I don't think the shots work to prevent diseases.....0.....1.....2.....3.....4
19. I worry my child might get sick from the shot.....0.....1.....2.....3.....4
20. My health care provider told me NOT to get my child his/her shots.....0.....1.....2.....3.....4
21. If something bad happened to my child after a shot, I would feel like it was my fault.....0.....1.....2.....3.....4
22. I worry about how safe shots are.....0.....1.....2.....3.....4
23. I don't think kids shots are important.....0.....1.....2.....3.....4

## **Appendix C**

### **SHOTS Survey Welcome Letter**

Thank you for your interest in using the SHOTS survey to explore the barriers to immunizations.

I am attaching the SHOTS Survey as a pdf file for your use. Please see below for additional scoring information.

#### Scoring the SHOTS Survey

A total composite score for each respondent is created for the total scale by summing all 23 items on the SHOTS survey. The range for the total score is 0-92. Higher numbers on the total score indicate more barriers to immunizations.

To obtain subscale composite scores all items in each subscale are added together. The Access to Shots subscale includes items #1-12 and the range is 0-48. The Concerns about Shots subscale includes items #13, 15, 16, 19, 21, 22 and the range is 0-24. The Importance of Shots subscale includes items # 14, 17, 18, 20, 23 and the range is 0-20.

The higher the scores, the more problematic that group of items are for parents getting their children shots. To compare the subscales with each other or the total scale to the subscale, calculate the mean for each subscale by dividing the composite score by the number of items making up the scale (example, for the Access to Shots scale, divide the total composite score by 12).

## Appendix D

### SHOTS Survey License Agreement

#### Licensing Agreement: Shots Survey



[Date]

Dr. Victoria Niederhauser hereby grants Danielle Bennett (hereafter referred to as CLIENT) permission to copy and distribute copies of the Searching for Hardship and Obstacles to Shots (hereafter referred to as the SHOTS Survey), copyright 2009 to Victoria Niederhauser, and to incorporate the copyright work, in whole or in part, into derivative works for exploring barrier to childhood immunizations. This agreement is effective for one year from the date on this agreement. Before using the SHOTS survey, carefully read the following License Agreement. If you do not accept the terms of this Agreement and Privacy Policy, you will not be authorized to use the SHOTS Survey.

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Danielle Bennett will adhere to this license agreement.

Signature

Danielle Bennett

Date

9/10/21

Return this form to: Dr. Victoria Niederhauser, University of Tennessee Knoxville, College of Nursing, 1209 Volunteer Blvd, Knoxville, TN 37996 or email to [vniederh@utk.edu](mailto:vniederh@utk.edu)

Appendix E

CHCSEK Approval



**Community Health Center  
of Southeast Kansas**

3011 N. Michigan • P.O. Box 1832 • Pittsburg, KS 66762 • (620)231-9873 • Fax: (620)235-0869

Danielle Bennett  
705 East Orange  
Girard, Ks. 66743

Dear Danielle,

Please accept this letter, and share with your PSU Advisor and or the Review Board, as permission to proceed with your scholarly project on the factors related to hesitancy for parents consenting to childhood immunizations.

After completing your research, please provide a copy of your findings and recommendations to me. Ideally what you learn will facilitate improvements for the patients we serve.

Wishing you success as you undertake this very worthwhile project.

Sincerely,

*Reta Baker*

Reta Baker, BSN, MPH  
VP of Clinical Education  
CHC/SEK  
3015 N. Michigan  
Pittsburg, Ks 66762