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Clinical Strategies to Increase Vaccination in the Pediatric Population: A Quality Improvement Project

Berthe Claudia Dupervil
bdupe002@fiu.edu

Clinical Strategies to Increase Vaccination in the Pediatric Population: A Quality Improvement Project

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By

BERTHE CLAUDIA DUPERVIL, MSN, APRN, CPNP-BC

Supervised By

FRANCISCO BRENES Ph.D., APRN-BC, FNP, PMHNP

Approval Acknowledged: DocuSigned by: 27267E9FF76F460... , DNP Program Director

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Abstract

Routine vaccination is a crucial public health intervention that reduces infectious disease prevalence and fatality rates. However, a decrease in vaccination rates among the pediatric population in the United States (U.S.) has been observed in recent years (American Academy of Pediatrics, 2021). Factors contributing to this decline include vaccine hesitancy, false information, moral or religious concerns, doubts about vaccine effectiveness, and clinical knowledge gaps among healthcare providers (American Academy of Pediatrics, 2021). The purpose of this quality improvement project was to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida. A descriptive, cross-sectional, pre- and posttest study design was employed to conduct this project. A convenience sampling method was used to recruit $N = 7$ participants. The project was conducted wholly remotely, including the delivery of the educational intervention and the administration of the pre- and posttests using a modified Health Belief Questionnaire Model (mHBQM) to measure the participants' knowledge of the topic of interest. Results revealed a substantial difference between pretest and posttest mean scores, with participants achieving higher scores on the posttest after the educational intervention, $t\ (7) = 2.147$, with a $p = 0.05$, ($p \leq 0.05$). Healthcare providers should be educated on clinical strategies to close knowledge gaps and improve vaccination in the pediatric population.

Keywords: Routine vaccination, clinical strategies, pediatric, and healthcare providers

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Introduction

Vaccination-preventable diseases are infectious diseases caused by bacteria or viruses that can be avoided with immunization or vaccination (DC Health, n.d.). Globally, infectious diseases contribute significantly to increased morbidity and mortality rates among the population. In 2018, there were 5.3 million pediatric fatalities worldwide, 700,000 of which were due to infectious diseases that vaccines may have prevented (Frenkel, 2021). Noticeable vaccine-preventable diseases prevalent in the United States (U.S.) include measles, mumps, pertussis, streptococcus pneumonia, and many others, with prevalence rates varying yearly. In 2018, the U.S. experienced 17 outbreaks of measles and 372 confirmed cases (Wisconsin Department of Health Services, 2018), and in 2020, there were approximately 1275 reported cases of measles in 31 states in the US (Elflein, 2022). In 2018, there were 17 confirmed occurrences of mumps among Wisconsin citizens in six counties, with ages ranging from 10 to 59 and 31 as the median age (Wisconsin Department of Health Services, 2018). As of 2020, approximately 3780 new cases of vaccine-preventable diseases were recorded in the U.S. (Elflein, 2022). People of all ages in the U.S. are still susceptible to pertussis. In 2020, there were approximately 18,617 confirmed cases of pertussis in the U.S. (Elflein, 2022).

Furthermore, the pediatric population is at high risk of vaccine-preventable diseases. This population includes people between infancy and adolescence, usually from birth to 18 years old; newborns, infants, toddlers, children and adolescents make up this demographic (Samuels-Reid & Cope, 2019). The pediatric population in the U.S. has been significantly impacted by diseases that can be prevented by vaccination. The prevalence and severity of many diseases have significantly decreased since vaccinations were introduced. Pertussis cases vary yearly, and sporadic outbreaks can happen in populations that have received vaccinations. Pertussis

continues to be the most common infection disease among infants under 1 year of age. There has been a change in the epidemiology of pertussis, and today, fully immunized children and adolescents account for an increasing percentage of reported cases in the United States (Elflein, 2022). The U.S. reported 339,420 pertussis cases between 2000 and 2016 (Skoff et al., 2019). Infant fatalities accounted for 88.8% of all deaths and had the most significant incidence (Skoff et al., 2019). Except for people under 1-year-old and people aged 19 to 64, incidence increased significantly over time for other age groups. Specifically, age-related increases in case counts were seen in people between the ages of 7 and 10 and 11 and 18 years (Skoff et al., 2019).

Despite widespread advances, some regions have seen drops in vaccination rates, raising worries about outbreaks of diseases that can be prevented by vaccination. The drop in vaccination rates has been linked to several factors, including vaccine hesitancy, false information, moral or religious concerns, and doubts or misconceptions about the effectiveness or safety of vaccines (Ventola, 2016). According to the United Nations International Children's Emergency Fund (UNICEF), pediatric immunization rates were affected by the COVID-19 pandemic (UNICEF, 2021). Due to alterations in healthcare availability and parental worries about virus exposure, there was a discernible reduction in routine kid immunizations during the early stages of the pandemic.

Although medical professionals are essential in promoting vaccination, there are specific educational gaps and misunderstandings among them in the United States. These discrepancies may hinder the promotion of vaccination in children and their families, which may impact the pediatric population's immunization rates. Some medical professionals worry that vaccinations for youngsters could cause an overabundance of immunity (Dubé et al., 2013). The promotion of immunization and prevention of diseases requires addressing vaccine reluctance. However,

healthcare professionals sometimes lack the clinical strategies or education required to deal with vaccine skepticism among parents and caregivers (Ventola, 2016). This may make it more difficult for them to handle vaccine hesitancy among patients and deliver correct information.

Vaccinations prevent children from contracting polio, hepatitis, measles, mumps, rubella, pertussis (whooping cough), and other infectious diseases. Unvaccinated children run an increased risk of catching these illnesses and their repercussions—lack of vaccination results in increased hospitalization, mortality, and healthcare costs for treatment. Nearly $27 billion is spent annually in the United States to treat adults for vaccine-preventable diseases. Vaccinations administered to children born in the United States between 1994 and 2013 are estimated by some models to prevent 322 million illnesses, 21 million hospitalizations, and 732,000 deaths throughout their lifetimes. The same cohort is expected to incur net savings of $295 billion in direct costs and $1.38 trillion in total societal costs (Kolobova et al., 2022). The purpose of this quality improvement project was to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida.

Problem Statement

Since 2020, there has been a global drop in routine childhood immunizations, placing millions more children at risk for vaccine-preventable diseases (Rachlin et al., 2022). According to Rahlin et al. (2022), at least 22.9 million children in 2020 and 25 million children in 2021 did not have access to or fully use routine immunization services. Vaccines are the most cost-effective method for lowering the disease burden among children. An estimated two to three million lives are saved every year by childhood immunizations, contributing significantly to the decline of the global infant death rate from 65 per 1,000 live births in 1990 to 29 per 1,000 live

births in 2018 (World Health Organization, 2020). Despite significant efforts, worldwide immunization coverage has stalled below the Global Vaccine Action Plan's targets (World Health Organization, 2020). Declining vaccination rates increase children' s susceptibility to disease and may lead to disease outbreaks. Even minor decreases in measles vaccination coverage might result in exponentially increasing outbreaks.

In 2019, the Centers for Disease Control and Prevention (CDC) documented the most significant number of measles cases since 1992, including a significant outbreak in a low-immunization-rate Orthodox Jewish community in New York. Vaccination protects infants and children against several diseases and indirectly protects unvaccinated children against diseases, impairments, and death (Nandi & Shet, 2020). Vaccination can help prevent associated out-of-pocket medical expenses, healthcare provider costs, and wage losses for patients and caregivers by preventing the occurrence of vaccine-preventable diseases. Studies have found a clear correlation between immunizations and cognitive ability and educational attainment, suggesting vaccines may have long-term positive economic effects (Nandi & Shet, 2020). Planning steps to improve the adoption of recommended pediatric immunizations and program evaluation depend on monitoring vaccination delays. If vaccination rates continue to decline, experts in public health warn that the United States could experience a rise in outbreaks of diseases that have not been experienced in decades. Vaccination services administered in primary healthcare institutions play a crucial role in preventing the most frequent diseases (Nandi & Shet, 2020). This quality improvement project was developed to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida.

Advanced Literature Review

The purpose of this quality improvement project was to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida. A literature review was performed using the Florida International University Library, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and PubMed databases to identify literature gaps pertinent to the research subject. Included in the list of essential search terms are "routine vaccination," "clinical strategies," "pediatric," and "healthcare providers." The search was restricted to papers published between 2017 and 2023, and only full-text English publications were chosen for review. Eleven publications explained and discussed the research problem and the project's overall objective. During a further evaluation of the chosen literature, the articles were separated into three major content groups:

1. Onset of Vaccine-Preventable Diseases in the Pediatric Population in the U.S.
2. Clinical and Knowledge Gaps Among Healthcare Providers on Routine Vaccination in Pediatrics
3. Studies Highlighting Strategies to Improve Vaccination in Clinical Settings

Onset of Vaccine-Preventable Diseases in the Pediatric Population in the U.S.

Vaccination is a well-researched approach to minimize serious health effects, lower the danger of communicable diseases, and prevent several diseases (Ventola, 2016). National immunization programs directed at newborns and children have considerably reduced the incidence, prevalence, severity, and death of numerous communicable diseases in Western countries (Ventola, 2016). Numerous vaccination campaigns focus on the pediatric population. However, children are more vulnerable to pathogens than adults due to their underdeveloped

immune systems, high exposure to pathogens in childcare centers and schools, and lower perceived risks. As a result, there are often speculations that vaccines often result in complications that endanger children's lives. There are also complaints regarding the efficiency of vaccines. This research topic aims to thoroughly examine the effect of pediatric vaccination on vaccine-related diseases and associated immunizations, the reasons for vaccine inefficiency, and the health outcomes between vaccinated and unvaccinated children.

La et al. (2020) employed a quasi-experimental study design to examine the estimated pre- and post-immunization impact in reducing vaccine-related diseases among children in the U.S. and the number of cases averted. The authors used stratified sampling to sample data from routine immunization for children aged ten and below against 14 infectious diseases from 2014 to 2019. Prior to the recommendation of each routine vaccine, pre-vaccine disease incidence was determined. The incidence of post-vaccination disease decreased for all age groups and disorders examined. For 10 of the 14 disorders considered, an incidence decrease of over 90% was attained. Influenza, rotavirus, and varicella were the diseases with the highest global estimates of post-vaccination illness incidence. In 2019, it was estimated that vaccinations prevented 1,269 cases of tetanus and more than 4.2 million cases of varicella each year. With the results, the authors concluded that routine childhood immunization in the U.S. has a significant, long-lasting impact on the disease burden. La et al. (2020) also suggested that, considering evolving disease epidemiology, modifications to advice, and the changing nature of immunization routine adherence, there is a need for updated public health effect estimations.

Talbird et al. (2022) used the quasi-experimental design method to report the updated impact of routine pediatric immunization in curbing vaccine-related infections among children 10 years and younger in the U.S. and to demonstrate the public-health effects of immunization.

The authors employed a stratified sampling technique to sample child exposure to 14 vaccine-preventable diseases and the impact of routine immunization by measuring the percentage decline in the prevalence of each ailment the program aims to treat across all age groups. Continuing their prior research, the methods used in the first report are the same except for a few additions. In the first report, Talbird et al. (2022) referenced under-reported data regarding the research area. However, they added that the childhood immunization program decreased the prevalence of all targeted diseases from 17% (influenza) to 100% (diphtheria, Hemophilus influenza type b, measles, mumps, polio, and rubella). They prevented more than 24 million disease incidents in the population of the United States in 2019. The authors advised that measures to preserve and boost vaccination compliance are required to sustain low prevalence levels of vaccine-preventable diseases.

According to Phadke et al. (2016), vaccine-preventable diseases have recently broken out in the United States due to parents' hesitation and refusal to vaccinate children, delaying routine immunization. The authors initiated a mixed-method research design to assess the relationship between vaccine refusal, delay, or rejection and the etiology of measles and pertussis, two vaccine-preventable illnesses with significant U.S. outbreaks. The authors used a non-probability sampling technique to collect data. The authors initially looked for measles and pertussis outbreaks across the United States in research published in PubMed from 2000 to 2015, using specific terms such as "measles and pertussis outbreak, respectively." Eighteen documented studies on measles were found (nine annual reviews and nine epidemic reports), describing 1416 cases (individual ages ranged from 2 weeks to 84 years; 178 cases were younger than 12 months), and more than half (56.8%) of whom had no prior measles vaccination history. A total of 574 instances of measles were unvaccinated despite being vaccine eligible, and 405 (70.6%)

of these occurrences had non-medical exclusions (exemptions based on faith or philosophical leanings as compared to medical restrictions; a total of 41.8% of cases). Thirty-two cases of pertussis epidemics were recorded, and 10,609 of those people had stated vaccination status (age range, 10 days-87 years). A significant percentage of people (between 24% and 45%) who were either under or unvaccinated were in the five most significant statewide epidemics. However, several pertussis outbreaks also happened in communities with high vaccination rates, a sign of decreasing protection. On unimmunized cases, nine papers (describing 12 outbreaks) offered comprehensive vaccination data; in eight of these outbreaks, 59% to 93% of the unvaccinated people were doing so on purpose. In the years following its eradication, most measles cases in the U.S. involved deliberately unvaccinated individuals. The issue of vaccine rejection was linked to an elevated risk for measles in both those who reject vaccinations and those who have received all recommended doses. Refusal to receive the vaccine was still linked to some communities' elevated risk for pertussis. However, the reappearance of pertussis has been linked to declining immunity and other reasons. Phadke et al. (2016) advised that immunization legislators should also examine the root causes of vaccine hesitancy, such as parental notions regarding the hazard and consequences of diseases that can be prevented by vaccination, the efficiency and reliability of routine vaccinations, as well as public trust in health care providers, businesses, and the system as a whole. Understanding the limitations of the available knowledge should not hinder practitioners' or policymakers' abilities to assist families and create sound policies; instead, it should serve as inspiration to create, enhance, and advance illness monitoring, identification, and outcomes-based research.

Hooker and Miller (2020) aimed to compare the health of pediatric populations who had received vaccinations against those who had not. Using a mixed-method experimental design,

data were collected from children born between November 2005 and June 2015 from three American health systems, and comparisons were made between the vaccinated and unvaccinated children in the first year of life for future occurrences of gastrointestinal diseases, asthma, ear infections, and developmental deficits. Medical records and diagnoses were assessed using the International Classification of Diseases-9 and International Classification of Diseases-10 codes. A logistic regression model was used to analyze subjects at least 3 years old, stratified by gender, birth year, and medical practice. There are hazards associated with vaccination, including the possibility of mortality, which is well acknowledged by the medical profession. However, it is widely believed that these unpleasant reactions, or adverse events, are uncommon and acceptable given the overall advantages of vaccination. A convenient sample of kids born into three different pediatric medical practices served as the basis for this investigation.

Developmental deficits, asthma, and ear infections were all associated with increased O.R.s in the vaccinated group compared to the unvaccinated group. The initial evaluation did not reveal an affiliation with gastrointestinal disorders. However, significant relationships were found in the third and fourth quartiles (in which more vaccine dosages were administered), at the 6-month break in the temporal analysis, and when the window of opportunity for diagnosis was gradually expanded from children under the age of 3 to children under the age of 5. One of its key advantages is that this study's results are based solely on patient medical records and diagnosis codes. Additionally, practitioners who made these diagnoses were readily accessible for direct guidance on the proper use of specific diagnosis codes (Hooker & Miller, 2020).

Additionally, although vaccination coding procedures varied amongst the three distinct pediatric practices, vaccination records were based on patient data. Cases and non-cases were categorized according to medical practice to consider any variations in diagnosing among the

three different practices. Therefore, no “cross comparisons” between two or more medical specialties were conducted. This study's primary flaw is that it used a convenience sample of three pediatric practices. Understanding the range of health impacts linked to vaccines and the entire childhood immunization schedule requires a detailed comparison of populations receiving vaccinations with those not (Hooker and Miller, 2020). Even with some limitations, the articles in this content area highlight the importance of routine vaccination to prevent some diseases from occurring either in childhood or later in adulthood. This study will work towards resolving vaccine hesitancy and finding measures to preserve and boost vaccination compliance.

Clinical and Knowledge Gaps Among Healthcare Providers on Routine Vaccination in Pediatrics

The primary prevention of dangerous infectious diseases is made possible through vaccination, one of the most significant public health initiatives ever devised in the history of medicine (Filia et al., 2019). Many nations in Europe and the rest of the world are currently experiencing declining childhood immunization rates. This endangers herd immunity and raises the possibility of disease outbreaks that can be prevented by vaccination. Vaccine hesitancy is one of the causes of declining vaccination coverage, according to the Strategic Advisory Group of Experts on Immunization (SAGE). Parents believe that healthcare professionals (HCWs) are the most reliable source of vaccine information, and it is well established that HCW recommendations impact vaccine decisions. However, HCWs, especially pediatricians, often have reservations about vaccinations' benefits and adverse effects and become reluctant to vaccinate themselves, their kids, or their patients (Paterson et al., 2016). Their opinions and attitudes may prompt them to prescribe vaccines to their patients less frequently and may harm parents' acceptance of vaccination.

Dybsand et al. (2019) employed a mixed-methods research design to evaluate and contrast the healthcare professional students' understanding, views, and beliefs on immunization. In order to evaluate students in nursing, medical, and pharmacy programs at two colleges in North Dakota, a cross-sectional survey was carried out in 2017. Six major themes were evaluated in the survey: (a) demographic data; (b) understanding of vaccines at a basic level; (c) reluctance to promote vaccines; (e) confidence in discussing vaccine-related matters with patients; (f) confidence in discussing vaccine-related issues with patients; and (g) an assessment of the vaccination training they have received. Two hundred and twenty-three people took the survey. A convenience sampling technique and thematic analysis were used to analyze the qualitative data emerging from the surveys. The results showed that students' understanding of vaccines differed substantially by program; those with solid knowledge scores included 74.3% of medical students, 62.7% of pharmacy students, 57.1% of DNP students, and 24.7% of BSN students. Compared to only 4.3% of medical students, over a third (34.2%) of BSN students thought the recommended vaccine schedule places unnecessary stress on a child's immune system. Furthermore, 54.2% of participants said scheduling the required vaccinations over several visits was a suitable way to lessen parental anxiety regarding vaccinations. The authors recommended that the gaps identified in the research should be targeted and interventions carried out to prepare future HCPs in their capacity to debate and educate the public regarding vaccination.

Del Duca et al. (2021) used a quantitative study design to evaluate the Italian pediatric healthcare professionals' (pHCPs) knowledge, awareness, and attitude toward immunizations. The study employed a convenience sampling technique. Two hundred thirty-one pediatricians and pediatric nurses voluntarily answered an anonymous online survey created by the vaccine committee of the Italian Society of Pediatric Allergy and Immunology (SIAIP) (PN). Descriptive

analysis was used to evaluate the quantitative data emerging from the surveys. Seventy percent of doctors and 13% of PN reported accurate vaccine knowledge, while 11% of pediatricians and 26% of PN indicated they obtained vaccine updates from social media rather than scientific sources. The study of pHCPs' views toward immunization in a family and personal setting reveals low immunization rates. About 63% of pediatricians got the flu vaccine yearly compared to 16% of PN ($p = 0.0001$). Regarding family settings, all immunizations were advised by 93% of pediatricians versus 51% of PN ($p = 0.0001$). Because of their perceived ineffectiveness, not all pHCPs routinely prescribed the anti-flu, anti-rotavirus, anti-zoster, and anti-pneumococcal vaccines (55% of pediatricians vs. 40% of PN). Forty-four percent of pediatricians and 40% of pediatric nurses preferred natural immunity. Parental vaccine hesitancy must be addressed to preserve the continuity of immunization services, and this can be done by educating pHCPs to increase their knowledge and counseling abilities.

Picchio et al. (2016) used a mixed-method study design to outline the knowledge, attitudes, and convictions of primary care practitioners in Barcelona who provide childhood immunizations regarding vaccines and vaccination. An organized survey of 277 participants was used to gather the data for the observational cross-sectional study. STATA version 11.0 was used to perform conventional descriptive statistics. For quantitative variables, the mean, standard deviation, and student's *t*-test were employed. Odds ratio and logistic regression were also used to examine the relationships between socio-demographic factors and VH. Non-probability sampling methods were used. Seventy-one respondents (25.6%; 95% CI: 20.8-31.1) to the study expressed skepticism of at least one vaccine on the recommended immunization schedule. Most respondents expressed skepticism about HPV and varicella immunizations. Thirty-four medical professionals (12.3%; 95%; CI: 8.8-16.7) reported skepticism regarding at least one vaccine

recently, except for varicella and HPV. According to Picchio et al. (2016), those involved in the systematic administration of childhood vaccines must be equipped with the knowledge and tools required to handle the escalating problem of vaccine hesitancy at a time when other information sources may override the vital role of primary healthcare workers. In this content area, emphasis is put on the importance of education among future and current healthcare providers. This study discussed strategies to improve vaccination, including the education of healthcare providers. These researched strategies can be taught to students in the medical field to equip them better to debate and educate the public about vaccination.

Studies Highlighting Strategies to Improve Vaccination in Clinical Settings

Childhood vaccination refusal or postponement by parents is standard and a significant factor in the recurrence of outbreaks of vaccine preventable diseases (VPD) (Anderson, 2014). Due to parental vaccine rejection or delay, under-immunized kids are more likely to be admitted to hospitals and use emergency rooms, have higher morbidity rates, and even experience vaccine-preventable illnesses resulting in deaths. Inadequate medical staff training, lack of a reminder mechanism for missed vaccinations, and ignorance of vaccination indications and contraindications are some of the challenges to immunization faced by healthcare providers (Anderson, 2014). Additionally, the quantity of recommended vaccines during well-child visits in the first year of life continues to cause discomfort for some parents and medical professionals. It is essential to identify strategies to enhance or promote childhood vaccinations to address this challenge.

Oku et al. (2016) conducted a qualitative study that gathered data on communication techniques to encourage childhood immunization uptake in Bauchi and Cross River States in Nigeria through semi-structured interviews, observations, and document analysis. The authors

used a non-probability sampling technique to retrieve data. The authors revealed that low vaccination rates resulted from vaccine hesitancy, distrust in the vaccine or provider, people's lack of understanding of the vaccine's value or need, lack of information, rumors, religious convictions, and illiteracy. The research proved that by increasing public awareness of the advantages of immunization, dispelling myths, rumors, or worries that discourage people from getting immunized, and providing people with information on where and when to receive vaccinations, effective communication strategies can potentially increase vaccination rates. Providers may want to evaluate whether actions in these categories could help combat vaccine reluctance in their setting. In addition, few interventions were directed at healthcare professionals.

Opel et al. (2018) employed a mixed-method research design to use a presumptive strategy to initiate children's vaccination. According to the study, suggesting vaccine administration provided better results than inquiring about a patient's notion of vaccination. Data for a longitudinal cohort study was obtained from kids enrolled in a Seattle-based integrated health system whose parents were anti-vaccine. Data were retrieved from 73 enrolled parent/child pairs. The researchers employed generalized estimating equations and linear regression to investigate the relationship between conversation format and immunization status. Over time, initiating the discussion of childhood vaccines using presumptive formats was associated with increased immunization. Although these findings must be confirmed using a randomized trial study design, they contribute to the growing body of evidence supporting the efficacy of presumptive initiation formats in the vaccine context. Evaluating the implementation of the presumptive format in clinical practice and interventions that combine the presumptive

format with other strategies designed to facilitate parental acceptance of childhood vaccines is necessary.

Zweigoron et al. (2017) conducted a mixed-method research study to comprehend the influence of practice-level variables on a child up to date (UTD) rates. A probability sampling method (randomization) was used to sample data for the research. Fifty-four practices were used as a sample size of the study to collect information on office procedures for staffing, vaccination administration, reminder-recall, and quality enhancement. Employing *t*-tests, analysis of variance, and linear regression, vaccination rates from the quantitative data were examined. Private practices and those who used standing orders had higher UTD rates at 24 months (p =.01; p =.03) but not at 35 months. At both 24 and 35 months, having a pediatrician on staff was linked to increased UTD rates (p = .01). Lower UTD rates were linked to taking walk-in patients and being a part of a network (p =.03; p =.03). The UTD rate increases at 24 and 35 months when the proportion of patients with publicly insured health care plans declines (r = -0.43, p =.001; r = -0.037, p =.007). Disclosed usage of reminder systems, evening, and nighttime hours, and accepting walk-in patients were not linked to higher UTD rates. Higher UTD rates were observed in practices with a more significant proportion of privately insured patients. The small sample size, the exclusion of rural practices, and the possibility of response bias constrained the findings.

Daley et al. (2018) carried out an RCT quantitative research study to determine whether a social media site with participatory vaccine information positively impacts parents' attitudes toward vaccination. The investigation was carried out in a sizable integrated hospital system in Colorado, and the data were sampled randomly from 1,093 study participants, of which only 945 (86.5%) completed all three surveys. An Internet-based intervention increased vaccination

attitudes among parents with reluctance. According to Daley et al. (2018), effective interventions are required to modify attitudes toward vaccines and behaviors regarding vaccination. By engaging in open discussions about vaccination with family and friends online and in person, parents can actively shape the public conversation and promote the significance of vaccination in preventing diseases. The articles in this category focus on strategies that can improve vaccination in the pediatric population. This study will address and educate healthcare providers (physicians, nurses, and medical assistants). The purpose of this quality improvement project was to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida.

Significance

Significance to Nursing Practice

Healthcare professionals are responsible for disseminating accurate health information. The nurses can assist patients by dispelling online inaccuracies and false information. Nurses should encourage patients to obtain vaccine-related information from reputable sources such as the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). In addition to providing patients with quality resources, nurses can provide individualized education. By providing education about vaccine efficacy and safety, vaccine benefits, and vaccine misconceptions, nurses can assist patients in making well-informed decisions. As they interact with parents throughout the office visit, nurses play a crucial role in increasing vaccine acceptance and fostering an immunization culture within the practice. Nurses must consider the causes of mistrust in the healthcare system when promoting vaccinations and public health education. A nurse can assist patients in making well-informed decisions by providing scientifically supported data (Centers for Disease Control and Prevention, 2021).

Children and their families will be at risk of vaccine-preventable diseases and outbreaks if the nursing profession does not promote immunization.

Significance to Nursing Research

Measuring routine childhood vaccination is essential for informing global vaccine policies and program implementation and monitoring progress toward goals established by the Global Vaccine Action Plan (GVAP) and Immunization Agenda 2030. There is a need for accurate estimates of routine vaccine coverage to pinpoint past successes and continuing challenges (Galles et al., 2021). Nurse researchers should investigate vaccine hesitancy in diverse populations and develop clinical strategies to increase vaccination in underserved communities. Such research could reduce vaccine-preventable diseases in vulnerable and diverse populations.

Significance to Health Policy

A national strategic plan is required to sustain and renew progress, resolve persistent and newly identified gaps, and respond proactively to the evolving landscape of vaccines. Its purpose is to prevent vaccine-preventable diseases (VPDs) in the United States and maintain vaccine safety. Several systematic monitoring programs for the safety of vaccines are in existence and continue to evolve and improve over time. To increase healthcare providers', policymakers', and the general public's trust in vaccines, it is essential to establish effective and transparent communication strategies on vaccine safety, from clinical trials to post-licensure safety monitoring and post-marketing surveillance (U.S. Department of Health and Human Services, 2021).

Purpose

The purpose of this quality improvement project was to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida.

Population, Intervention, Comparison, and Outcome (PICO) Clinical Question

Is there a significant difference between pre- and posttest scores among healthcare providers at a community clinic in Tallahassee, Florida after an educational intervention regarding clinical strategies to increase vaccination in the pediatric population?

Ho: There is no significant difference between pre- and posttest scores among healthcare providers at a community clinic in Tallahassee, Florida after an educational intervention regarding clinical strategies to increase vaccination in the pediatric population.

Ha: There is a significant difference between pre- and posttest scores among healthcare providers at a community clinic in Tallahassee, Florida after an educational intervention regarding clinical strategies to increase vaccination in the pediatric population.

Definition of Terms

The variables of this project were knowledge base, age, gender, licensure, and years of experience; they are described in the following paragraphs.

Knowledge Base

This variable referred to the knowledge base of healthcare professionals regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida. The researcher utilized the modified health belief model questionnaire (HBMQ) to measure healthcare providers' knowledge base. According to Sulat et al. (2018), the validity of HBQM is: 100% for perceived barriers, 83% for vulnerability, 82% for benefits, and

36% for perceived severity (Sulat et al., 2018). This test has a total of 15 questions. The highest score a participant can obtain on the test is 15, with the lowest possible score being zero.

Age

This ratio variable includes the age of healthcare providers who work at a community clinic in Tallahassee, Florida. This variable was organized as follows: (a) 18-30 years, (b) 31-45 years, and (c) 46 years and older.

Gender

This nominal variable encompasses the gender of healthcare providers who work at a community clinic in Tallahassee, Florida. This demographic variable was sorted as follows: (a) female and (b) male.

Licensure

This nominal variable refers to the licensure of healthcare providers who provide care to pediatric patients at a clinic in Tallahassee, Florida. This demographic variable was classified as follows: (a) medical assistant (MA), (b) licensed practical nurse (LPN), (c) registered nurse (RN), (d) advanced practice registered nurse (APRN), and (e) physician (MD or DO).

Years of Experience

This nominal variable was associated with the years of experience of healthcare providers who work at a community clinic in Tallahassee, Florida. This demographic variable was grouped as follows: (a) 0-5 years, (b) 6-10 years, and (c) 11 years and more.

Conceptual Underpinning of the Project

This project was carried out under the positivist paradigm. This quality improvement project intends to assess healthcare workers' understanding of clinical techniques to increase immunization in the pediatric population at a community clinic in Tallahassee, Florida, before

and following an educational intervention. This positivist researcher hypothesized that the healthcare practitioners participating in the project would better understand clinical techniques to increase vaccination in the pediatric population. This researcher employed scientific approaches to assess data and examine results.

Theoretical Framework of the Project

The researcher used the modified health belief model questionnaire (HBMQ) to direct the quality improvement initiative. Godfrey Hochbaum, Stephen Kegels, Howard Leventhal, and Irwin Rosenstock created the HBM in the 1950s to explain why individuals fail to engage in preventative health behaviors (Grinberg & Sela, 2021). The HBM is a framework for health promotion and disease prevention initiatives. It is used to characterize and forecast changes in the health habits of individuals. It is one of the most common health behavior analysis models.

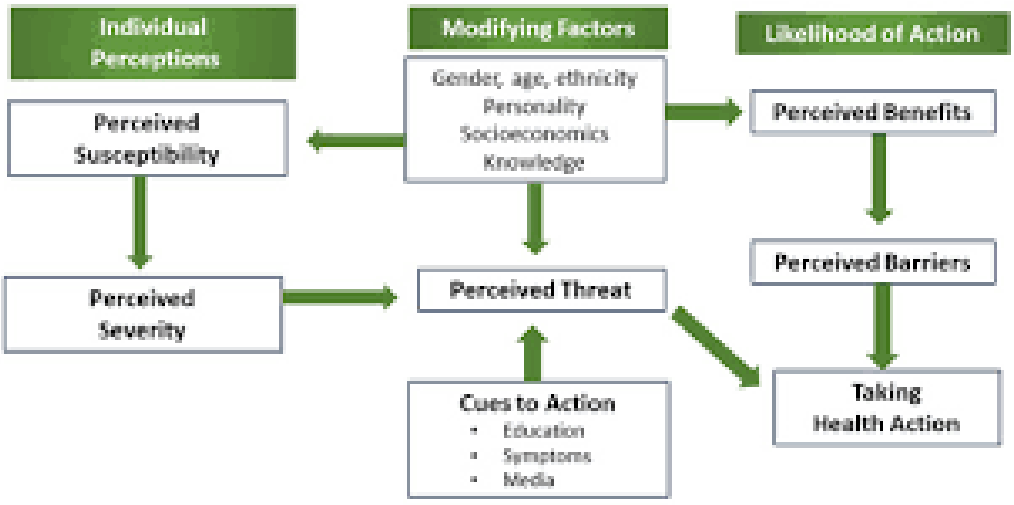
The HBM consists of the following components, according to Grinberg and Sela (2021): perceived severity of the medical problem, perceived susceptibility to illness, perceived threat of illness, perceived benefits of health-related activity, perceived barriers and disadvantages of health-related behavior, and health motivation (See Figure 1). Perceived disease severity refers to an individual's perception of a disease's severity and probable consequences. This component reflects the individual's perceptions of the difficulties associated with the condition, such as pain, discomfort, and financial strain. Perceived susceptibility refers to an individual's subjective evaluation of his or her sickness sensitivity. Perceived threat of illness is the association of perceived susceptibility and severity of a health condition together.

Furthermore, perceived benefits refers to an individual's comprehension of the benefits of a prescribed health-related behavior to prevent illness or alleviate symptoms. A vaccine, for

instance, protects the individual from disease and keeps others safe. Perceived barriers of health-related conduct refer to detrimental features of such behavior or factors that impede or want to stop the action, such as fear of pain and unpleasant side effects of immunizations. Health motivation explains the individual's incentive to be healthy, i.e., if they lead a healthy lifestyle and how this influences their decision to obtain a vaccination. The researcher used this framework to persuade healthcare practitioners of the value of adopting effective strategies to educate children and their families about the importance of vaccination as a critical step in preventing specific childhood diseases.

Figure 1

Health Belief Model and Its Components



Methodology

The purpose of this quality improvement project was to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida. A comprehensive literature review was conducted, and literature gaps were discovered. The researcher describes the design, setting,

sample, inclusion criteria, exclusion criteria, intervention, measures and instruments, data collection procedures, data analysis, and protection of human subjects in the following paragraphs.

Study Design

This study used a quantitative, descriptive, cross-sectional, pre- and posttest design.

Quantitative Research

The quantitative technique uses statistics to solve research questions by analyzing numerical data collected by researchers (Goertzen, 2017). The researcher utilized Qualtrics to collect demographic and pre- and posttest data from healthcare practitioners to evaluate knowledge awareness of clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida. Version 26.0 of Statistical Package for the Social Sciences (SPSS) was used to investigate the differences between the variables.

Descriptive Design

Descriptive study design is an effective method for acquiring information about a specific group or subject. This type of research provides an exhaustive and accurate portrayal of the characteristics and behaviors of a specific community or issue. Through observation and data collection on a particular subject, descriptive research gives a deeper understanding of a particular issue. It offers crucial insights for future studies (Aggarwal & Ranganathan, 2019). This study collected data and explored healthcare providers' knowledge base of the topic of interest.

Cross-Sectional Design

This type of study evaluates the participants' outcomes and exposures. Participants are selected based on predetermined inclusion and exclusion criteria. Once participants are chosen, the investigator oversees the study to assess the exposure and effects (Aggarwal & Ranganathan, 2019).

Pre- and Posttest Design

A pre- and posttest design was applied to examine improvements in knowledge and awareness of clinical strategies to increase vaccination in the pediatric population among healthcare practitioners. Before and after a pedagogical intervention, knowledge awareness was measured. The researcher utilized a 15-question test using the modified health belief model questionnaire (mHBMQ) to evaluate the healthcare providers' knowledge base.

Setting

The project was conducted at a pediatric community clinic in Tallahassee, Florida.

Sample

The sample comprised of $N = 7$ healthcare professionals working at the community clinic in Tallahassee, Florida. Participants were recruited, and data were accessed using a convenience sampling strategy. Convenience sampling is when the first available primary data source is used without further restrictions for the research (Stratton, 2021).

Inclusion Criteria

The study includes healthcare professionals at the community clinic in Tallahassee, Florida, who are at least 18 years old. Only individuals who give direct care to the pediatric

and obstetric population and those hired as medical assistants, licensed practical nurses, advanced practice registered nurses, or physicians were permitted to participate in the study.

Exclusion Criteria

Non-employees of this community clinic in Tallahassee, Florida, were not permitted to participate in the study. People younger than 18 years old were excluded. Healthcare professionals who do not work with children or pregnant women were also excluded.

Intervention

Before data collection, approval from the Institutional Review Board (IRB) of Florida International University (FIU) was obtained. After obtaining approval from the nursing management team, email invitations were sent to prospective participants. Before participating in the study, the subjects were given a summary of the project and signed an informed consent form. Participants completed an online demographic questionnaire and a pretest survey using Qualtrics to measure their knowledge and understanding of educating parents about vaccines and clinical techniques to increase vaccination in the pediatric population at the community clinic. After completing the online pretest questionnaire, participants viewed a voiceover PowerPoint presentation designed to boost their knowledge and awareness of clinical strategies to increase pediatric immunization. The researcher served as the presentation's moderator. Immediately after the PowerPoint presentation, participants took an online posttest questionnaire powered by Qualtrics to reassess their knowledge and awareness of clinical approaches to promote immunization in the pediatric population.

Measurements and Instruments

The following demographic data were collected: age – (a) 18-30 years, (b) 31-45 years, (c) 46 years and older); gender – (a) male and (b) female); licensure – (a) MA, (b) LPN, (c) RN, (d) APRN, (e)MD or (f) DO; and years of experience in the current position – (a) 0-5 years, (b) 6-10 years, (c) 11years and more. Before and after the educational intervention, a 15-item test using the modified health belief model questionnaire (mHBMQ) was used to collect and analyze data. Scientists employ the health belief model questionnaire (HBMQ) to project health behaviors. The approach is founded on the idea that an individual's capacity to modify their health-related activities is primarily influenced by their views of their health. According to the HBM, individuals' views of particular behaviors can predict how effectively they will perform.

Considering the outcome of preventive health behavior, the validity of HBMQ is as follows: perceived barriers (100%), vulnerability (83%), benefits (82%), and perceived severity (36%) (Sulat et al., 2018). The HBMQ has shown to be beneficial for characterizing various disease prevention behaviors in the past. These behaviors are well established, increase the likelihood of early disease diagnosis, and have implications for behavior adjustments that are typically well known (Sulat et al., 2018). The HBMQ can be accessed publicly. The modified HBMQ consists of 15 multiple-choice questions. One point will be rewarded for a correct response, while no points will be awarded for an incorrect answer. The lowest possible score is zero, and the highest is 15.

Data Collection Procedures

Approval from FIU's IRB was obtained prior to data collection. This researcher also gained authorization from the managing team at the community clinic in Tallahassee,

Florida, to execute the quality improvement study. At the community clinic in Tallahassee, Florida, convenience sampling method was employed to recruit participants and access data. Potential participants received an email detailing the goal and objectives of the quality improvement project along with a link to the Qualtrics survey. Age, gender, licensure type, and years of experience in current employment were collected via an online demographic survey that participants completed. Next, the participants took a 15-item pretest using Qualtrics and the modified HBMQ. The participants also completed a posttest survey online after an educational intervention. This latter consisted of a 10-minute voice over PowerPoint presentation. The demographic survey, pretest survey, educational intervention, and posttest survey lasted 45 minutes. The researcher conducted the project over 8 weeks.

Data Analysis

The Statistical Package for the Social Sciences (SPSS) was utilized for data entry, coding, and analysis. The researcher did a descriptive analysis to examine the data. Mean, median, mode, frequency, standard deviation, and range were calculated for the variables. The *t*-test was used to identify statistically significant changes between the tests and mean values. A *p*-value of 0.05 or less was considered statistically significant (Polit & Beck, 2022).

Protection of Human Subjects

Assuring research participants that their personal information will be safe is vital to safeguard study participants. This includes protecting participants' privacy, ensuring the confidentiality of information, and letting participants remain anonymous (White, 2020). The data gathering for this study was handled anonymously using Qualtrics. At any time, participants may have withdrawn from this project without incurring penalties. To protect the

privacy of study participants, the researcher encrypted computer-based data. Also, the researcher obtained CITI accreditation in ethics for protecting human subjects in social and behavioral research prior to the implementation of the quality improvement project.

Results

The purpose of this quality improvement project was to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida. Using a convenience sampling technique, participants completed demographic, pretest and posttest surveys, as well as viewed an educational intervention in the form of a voice over PowerPoint presentation. Data was collected anonymously using Qualtrics. The Statistical Package for Social Sciences Program (SPSS) version 26.0 was used for data analysis. This researcher will provide demographic data and findings of the project related to the PICO clinical question in the sections below.

This quality improvement project was conducted over a period of eight weeks from July 24, 2023, to September 24, 2023. Two Qualtrics surveys were used; the first one contained the demographic questionnaire and the pretest using the modified HBQM. The second Qualtrics survey contained the posttest, modified HBQM. A total of $N = 7$ participants completed the demographic survey, pretest, and posttest.

According to the results, age varied among the participants (see Table 1 and Figure 2). More than 50% of the participants were 46 years old and older, close to 25% of the participants were 31 to 45 years old, and less than 15% were 18 to 30 years old.

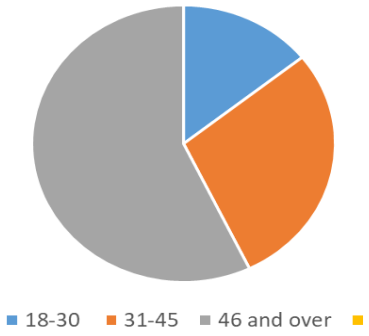
Table 1

Age Distribution Among Healthcare Providers at a Community Clinic in Tallahassee, FL (N = 7)

Years	Frequency	Percentage (%)
18-30	1	14.29%
31-45	2	28.57%
46 and older	4	57.14%
Total	7	100

Figure 2

Age Distribution



The gender of the participants was classified as male or female. The gender distribution among participants was unequal (see Table 2). Most participants were females, and less than 15% of males participated in this project.

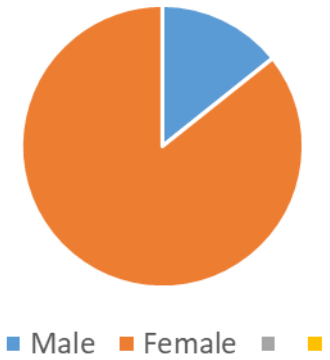
Table 2

Gender Distribution Among Healthcare Providers at a Community Clinic in Tallahassee, FL (N = 7)

Gender	Frequency	Percentage (%)
Male	1	14.28
Female	6	85.72
Total	7	100

Figure 3

Gender Distribution



Role of participants was also unequally distributed (see Table 3 and Figure 4). Most participants were advanced practice registered nurses (APRNs). However, fewer than 15% of participants were medical assistants (MAs). Physicians (MD or DO) represented 14% of the sample.

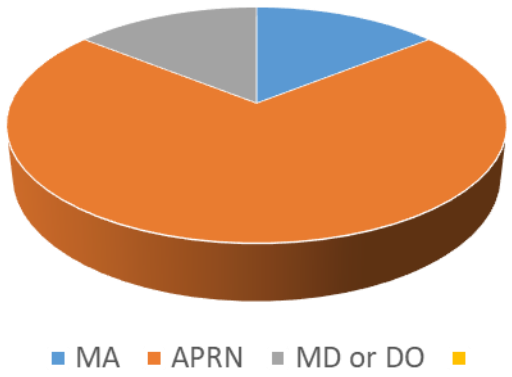
Table 3

Role Among Healthcare Providers at a Community Clinic in Tallahassee, FL (N = 7)

Years	Frequency	Percentage (%)
MA	1	14.29
APRN	5	71.42
MD or DO	1	14.29
Total	7	100

Figure 4

Healthcare Provider Roles



Most of the participants had been in their role for 0-5 years (36.4%). Less than 20% of participants had 11 years or more of experience in their role, while less than 10% of participants had 6-10 years of experience in their role (see Table 4 and Figure 5).

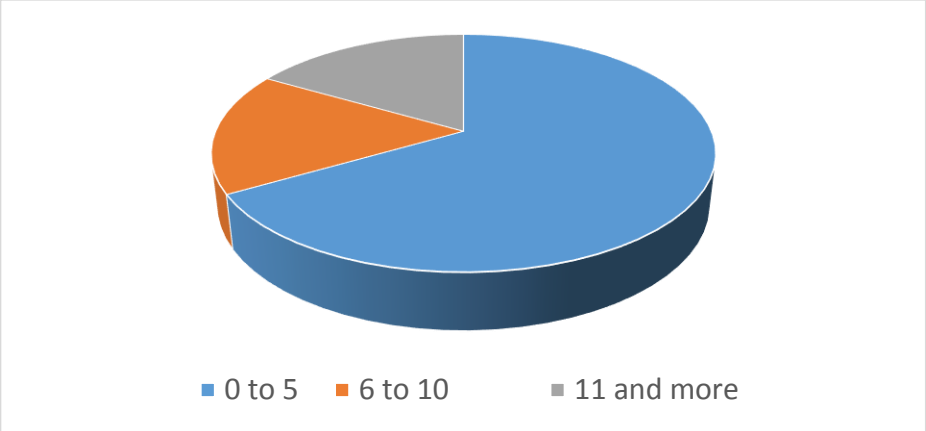
Table 4

Years of Experience Among Healthcare Providers at a Community Clinic in Tallahassee, FL (N = 7)

YEARS	FREQUENCY	PERCENTAGE (%)
0-5	4	36.4
6-10	1	9.1
11 and more	2	18.5
Total	7	100

Figure 5

Years of Experience



PICO Clinical Question

The PICO clinical question was "Is there a significant difference between pre- and posttest scores among healthcare providers at a community clinic in Tallahassee, Florida after an educational intervention? Furthermore, the alternative hypothesis was "There is a significant difference between pre- and posttest scores among healthcare providers at a community clinic in Tallahassee, Florida after an educational intervention." Results revealed that there was an increase in knowledge awareness among healthcare providers after a research-based educational intervention at a community health center in Tallahassee, Florida. For a sample size of $N = 7$ healthcare providers, the pretest mean (M) score for number of correct answers among participants was 12.71. However, the posttest M score (13.71) for number of correct answers among participants was higher than that of the pretest. These results indicate that participants scored higher on posttests after an educational intervention than on pretests. Therefore, participants had an increase in knowledge of clinical strategies to improve vaccination in the pediatric population.

Table 5

Paired Sample Descriptive Statistics (N = 7)

	N	Range	Minimum Correct	Maximum Correct	*M*	*SD*
Pretest	7	12	11	14	12.71	1.254
Posttest	7	14	13	14	13.71	0.488

A two-tailed paired samples t-test was conducted to discover significant differences between pre- (M=12.71) and posttest (M=13.71) mean scores (see Table 6). Results revealed a significant difference between pre- and posttest M scores, t (7) = 2.317, p = 0.05, ($p \leq 0.05$),

among participants with higher scores on posttests after an educational intervention. Moreover, based on the *t*-test result and an alpha value ≤ 0.05, the researcher could accept the alternative hypothesis (*Ha1*) for the PICO clinical question. These results overall indicate that healthcare providers experienced an increase in knowledge of clinical strategies to improve vaccination in the pediatric population.

Table 6

Two-Tailed Paired Samples t-Test Between Pre- and Posttest Mean Score

	M	*SD*	95% Confidence Interval of the Difference		t	df	*p* value
Posttest - Pretest	13.71	0.488	Lower 13.3	Upper 14.1	2.317	7.78	0.05

This researcher conducted the Shapiro-Wilk test for both the pretest and posttest scores to assess for normality of the data. Based on the Shapiro Wilk test, the data had a normal distribution (see Table 7, Figure 6, and Figure 7).

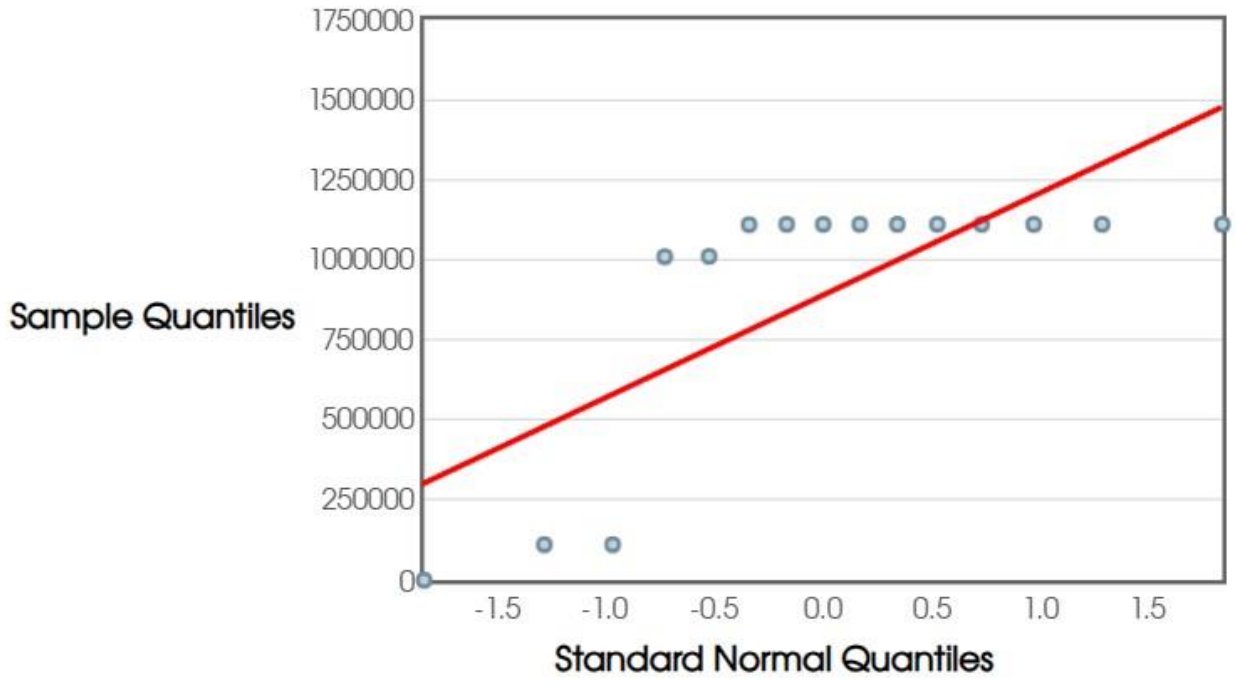
Table 7

Test of Normality

	Shapiro-Wilk		
	Statistic	df	Sig.
Posttest	0.60	7	0.001
Pretest	0.81	7	0.057

Figure 6

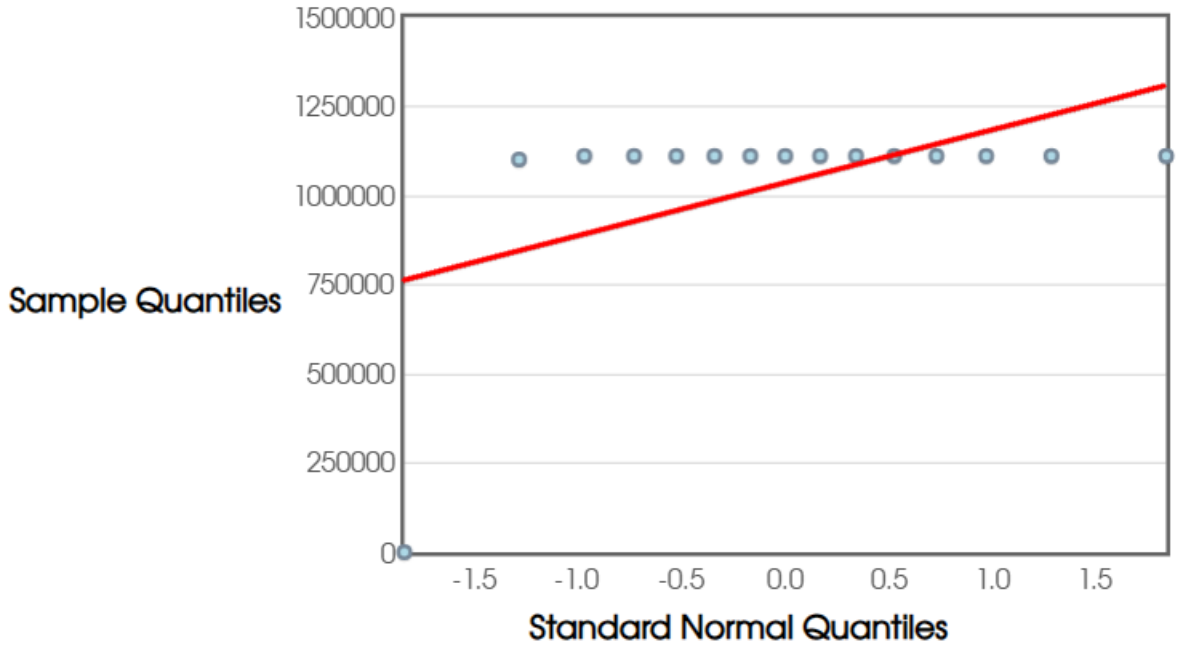
Normal Q-Q Plot of Pretest Score



r = 0.7484 sig (0.01)= 0.8474 Sig(0.05)= 0.8970

Figure 7

Normal Q-Q Plot of Posttest Score



r = 0.5149 sig (0.01)= 0.8474 Sig(0.05)= 0.8970

Summary and Discussion

The purpose of this quality improvement project was to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population at a community clinic in Tallahassee, Florida. This researcher utilized a quantitative, descriptive, cross-sectional, pre- and posttest design to conduct the quality improvement project. The project was conducted remotely, and participants completed demographic, pre-, and posttest surveys using Qualtrics and the modified Health Belief

Questionnaire Model (mHBQM). A convenience sampling technique was utilized to recruit seven participants. Differences between the variables were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0. This researcher will further compare the project findings with the literature in the section below. In addition, this researcher will discuss implications for advanced practice nursing, limitations of the project, recommendations, and conclusions.

Summary of the Results and Discussion

The project results revealed that there was an increase in knowledge among healthcare providers regarding clinical strategies to increase vaccination in the pediatric population after a research-based educational intervention. Results using a two-tailed paired samples *t*-test revealed a substantial difference between pre- and posttest *M* scores among healthcare providers, $t\ (7) = 2.317$, $p = 0.05$, ($p \leq 0.05$), with greater scores on posttests after an educational intervention.

O'Donnell et al. (2018) conducted a study to identify barriers to the administration of the herpes zoster vaccine (HZV) by nurse practitioners (NPs) and utilize the findings to guide the development and evaluation of an educational program. The study included a cross-sectional survey methodology, which involved primary care Nurse Practitioners (NPs) who were affiliated with the Nurse Practitioner Association of New York State and were currently engaged in providing healthcare services to individuals aged 50 years and above. This research was conducted in two phases. Barriers affecting the delivery of HZV were identified during Phase I, and NPs were surveyed to determine their current HZV practice. During Phase II, New York state nurse practitioners (NPs) who were identified as potential vaccination providers were extended an invitation to actively engage in a 60-minute educational session delivered by a proficient expert in the field of herpes zoster vaccine

(HZV). Nurse practitioners were extended an invitation to participate in a voluntary manner via a website posting. The posting included a hyperlink that connected them to an anonymous web-based survey platform known as Qualtrics. Prior to and during the training, the participants were requested to fill out anonymous questionnaires. The data analysis was conducted using IBM SPSS Statistics and Microsoft Excel software packages. The survey request yielded a satisfactory response rate, with a sample size of 112 participants. A comparative analysis of test scores was performed using a paired-samples *t*-test prior to and following the 60-minute interactive program. A statistically significant difference was observed in the knowledge survey scores between the pretest and posttest (mean = 3.4, *SD* = 1.2; mean = 4.7, *SD* = 1.3; t (37) = −7.1, *p* <.0). The educational program enhanced the knowledge of HZV among NPs. It has been shown that nurse practitioners encounter obstacles to delivering the Centers for Disease Control and Prevention (CDC) recommended herpes zoster vaccine (HZV). These barriers primarily originate from a deficiency in understanding various facets of HZV delivery. The findings presented in this study contribute to the expanding volume of evidence that highlights the necessity for the broad distribution of information among healthcare practitioners. Consequently, these results have served as a basis for initiating Part Two of this research endeavor. The educational programs were positively received, and the outcomes demonstrated statistical significance in improving provider knowledge. Similar to the findings of this project, there was an increase in knowledge among the healthcare providers after the educational intervention.

Chiswell et al. (2019) conducted a study to evaluate the impact of a comprehensive educational intervention, targeting both patients and healthcare providers, on the prescription patterns of antibiotics for respiratory tract infections (RTIs) at a primary care clinic located in a rural area in the United States' Southwestern Region. A quasi-experimental pretest-posttest

design was employed to investigate the impact of a patient and provider education program on the prescription rates of antibiotics (immediate or delayed) for patients visiting healthcare facilities for respiratory tract infections (RTI). The study involved a retrospective review of electronic medical records and included a total of 207 patients who were randomly selected during the designated evaluation periods. The preintervention group had an antibiotic prescription rate of 56.3%. However, the postintervention group had a rate of 28.8% ($p <$ .01). In the preintervention group, antibiotics were promptly initiated in 31.1% of cases. However, in the postintervention group, this occurred in only 13.5% of cases ($p < .05$). The implementation of the patient education intervention program lasted for one year, aligning with the guidelines outlined in the Clinical Practice Guidelines (CPG) on the necessary education for all patients with respiratory tract infections (RTI). Significant reductions in both immediate and total antibiotic prescriptions for RTIs were observed following the combination education initiative's implementation. A reduction in antibiotic usage when not medically necessary is the overarching objective. The findings of this study provide evidence that educational interventions can yield positive outcomes in rural environments, specifically in modifying antibiotic prescribing practices. This study also demonstrated the effectiveness of educational interventions in the healthcare industry.

A study conducted by Cowdery et al. (2019) examined the efficacy of an instructional video targeting healthy adolescents and young adults, with regards to factors influencing their participation in clinical trials. The sample of this cross-sectional, pre- and posttest study consisted of 935 participants in the U.S. (Cowdery et al., 2019). Participants were instructed to complete a 49-item pretest survey. Upon completion of the pretest, participants were shown (in person), or directed to (imbedded in the electronic survey), a 10-minute video. A group of undergraduate students ($N = 1048$) at a large public university in southeast

Michigan 18 to 40 years of age participated in the study. Descriptive statistics were calculated for the group overall and Wilcoxon signed-rank tests were performed to assess differences in pre- and posttest responses. Mean differences in scores from pretest to posttest were calculated for knowledge, attitude, and self-efficacy and compared using paired-samples *t*-tests. Researchers reported that participants indicated a higher intention to participate in a clinical trial ($p < 0.0001$) and receptivity to hearing more about a clinical trial ($p < 0.0001$) after seeing the video (Cowdery et al., 2019). This single-group pretest/posttest intervention shows strong evidence for the effectiveness of a brief video on factors related to participation in clinical trial research in an adolescent and young adult population (Cowdery et al., 2019).

Implications for Advanced Practice Nursing

This quality improvement project has significant implications for advanced practice nursing. This project helped healthcare providers improve their knowledge regarding clinical strategies to increase vaccination in the pediatric population. Based on the study, healthcare providers can aid patients by debunking mistakes and misinformation found on the internet related to vaccination. Clinicians, particularly advanced practice nurses, can promote patients' acquisition of vaccine-related information from credible sources, such as the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). In addition to providing patients with high-quality resources, they can deliver personalized instructions. Furthermore, nurses and other healthcare providers can play a crucial role in facilitating patients' informed decision-making by imparting knowledge on vaccine efficacy and safety, elucidating the advantages of vaccination, and addressing prevalent misunderstandings around vaccines. Healthcare providers are vital in enhancing vaccination acceptance and cultivating a culture of immunization within the healthcare practice by engaging with parents during office visits. Nurse

practitioners and other clinicians should consider the factors contributing to distrust within the healthcare system when advocating for vaccinations and public health education.

Limitations of the Project

Studies have limitations. The limitations of this project were:

1. Convenience sampling method does not involve randomization.
2. Data were collected from participants employed at a community clinic in Tallahassee, Florida; A low number of participants decreased the generalizability of this project. Therefore, results cannot be generalized to other clinical settings.
3. Most participants were women.
4. A cross-sectional, pretest and posttest design cannot establish a cause-and-effect relationship or analyze behavior over a period of time.

Recommendations

Future studies, especially randomized controlled trials, are needed to identify the best methods to deliver an educational intervention to measure increases in knowledge among healthcare providers regarding clinical strategies to increase vaccination in the pediatric population. Researchers may consider future longitudinal or experimental studies to investigate cause and effect correlations. Additional research should also be conducted with a larger sample size to be able to generalize the results. More studies also need to be conducted in different patient settings such as the inpatient setting or private practice. Furthermore, future research should focus on quantitative data to analyze correlations between demographic variables and the knowledge bases of healthcare providers in the U.S. More women than men participated in this study. Therefore, gender diversity is encouraged for future studies. Combining multiple sampling techniques, such as random sampling, stratified

sampling, or systematic sampling, can help improve the quality of studies, which can lead to more accurate and reliable research outcomes.

Conclusion

The findings of this study showed that there was an increase in knowledge of clinical strategies to improve vaccination in the pediatric population among healthcare providers at a community health center in Tallahassee, Florida after a research-based educational intervention. Results of this project revealed a significant difference between pre- and posttest *M* scores among participants, $t\,(7) = 2.317$, $p = 0.05$, ($p \leq 0.05$), with higher *M* scores on posttests after an educational intervention. Healthcare providers should receive training on vaccination clinical strategies in pediatrics to improve health outcomes and quality of care in this population.

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Appendix **A**

FLORIDA INTERNATIONAL UNIVERSITY

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

FIU | FLORIDA INTERNATIONAL UNIVERSITY

Office of Research Integrity

Research Compliance, MARC 430

MEMORANDUM

To: Dr. Francisco Brenes

CC: Berthe Dupervil

From: Kourtney Wilson, MS, IRB Coordinator KWW

Date: June 29, 2023

Protocol Title: **"**Psychedelic researcher demographics, psychedelic use and allegiance bias**"**

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #: IRB-23-0351 **IRB Exemption Date:** 06/29/23
TOPAZ Reference #: 113405

As a requirement of IRB Exemption you are required to:

1) Submit an IRB Exempt Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved prior to implementation.

2) Promptly submit an IRB Exempt Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.
3) Submit an IRB Exempt Project Completion Report Form when the study is finished or discontinued.

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

KMW

Appendix B

FLORIDA INTERNATIONAL UNIVERSITY

SUPPORT LETTER FROM FACILITY

Bond Community Health Center, Inc.

June 20, 2023

Francisco Brenes, Ph.D., APRN, FNP, PMHNP-BC
Clinical Assistant Professor
Nicole Wertheim College of Nursing & Health Sciences
Florida International University

Dear Dr. Brenes:

Thank you for inviting Bond Community Health Center to participate in the DNP Project of Berthe Claudia Dupervil. I understand that this student will be conducting this project as part of the requirements for the Doctor in Nursing Practice program at Florida International University. After reviewing the proposal of the project titled " Clinical Strategies to Increase Vaccination in the Pediatric Population: A Quality Improvement Project Among Healthcare Providers", I have warranted her permission to conduct the project in this company.

We understand that the project will be developed in our setting and will occur in two sessions in a four-week time frame and will probably be implemented afterward. We are also aware of our staff participation in supporting the student to complete this project, including warrant the student access to our facilities, give consent, deliver the pre-test questionnaire, provide the educational intervention and four weeks after providing the posttest to the recruited participants. We will provide a peaceful environment to safeguard our participant privacy as well as adequate area to conduct the educational activity.

This project intends to evaluate if a structured education targeting providers and staff will improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population. The project will be conducted with the previous consent of potential participants working in our facilities. Prior to the implementation of this project, the Florida International University Institutional Review Board will evaluate and approve the procedures to conduct this project.

We expect that Berthe Claudia Dupervil will not interfere with the normal office performance, behaving in a professional manner and following the office standards of care. As the Chief Medical Officer at Bond Community Health Center, I support the participation of our providers and staff in this project and look forward to working with you.

Sincerely,

Dr. Tabitha Rios

Chief Medical Officer

1720 South Gadsden Street - Tallahassee, Florida 32301
Telephone: 850.576.4073 - Fax 850.576.2824

Appendix C

FLORIDA INTERNATIONAL UNIVERSITY

RECRUITMENT EMAIL LETTER

Recruitment Email for developing **Clinical Strategies to Increase Vaccination in the Pediatric Population: A Quality Improvement Project Among Healthcare Providers**

Dear Bond healthcare professional,

My name is Berthe Claudia Dupervil, and I am a student from the Graduate Nursing Department at Florida International University. I am writing to invite you to participate in my quality improvement project. The goal of this project is to improve the knowledge base of healthcare providers regarding clinical strategies to increase vaccination in the pediatric population. You are eligible to take part in this project because you are a healthcare provider at Bond Community Health Center, and you provide or may provide care to the pediatric population. I am contacting you with the permission of your Chief Medical Officer.

If you decide to participate in this project, you will complete a pre-test questionnaire, which is expected to take approximately 15 minutes. Then, you will then be asked to view an approximately 10-minute-long educational presentation online. After watching the video, you will be asked to complete the post-test questionnaire, which is expected to take approximately 15 minutes. *No compensation will be provided.*

Remember, this is completely voluntary. You can choose to be in the study or not. If you'd like to participate, please click on the link provided (link for Qualtrix questionnaire). If you have any questions about the study, please email or contact me at cduqu015@fiu.edu or 305-298-7897.

Thank you very much.

Sincerely,

Berthe Claudia Dupervil

link for Qualtrix questionnaire:

https://fiu.qualtrics.com/jfe/form/SV_bauneLMaNvs4et8

Click on link or Copy/Paste link on a browser

Appendix D

FLORIDA INTERNATIONAL UNIVERSITY

RESEARCHER-DEVELOPED DEMOGRAPHIC INSTRUMENT

Q1 What is your age?

- 18-30 years
- 31-45 years
- 46 years and older Q2 What is your gender?
- Male
- Female

Q3 What is your licensure type?

- MA
- LPN
- RN
- APRN
- MD or DO

Q4 Years of experience?

- 0-5 years
- 6-10 years
- 11 years or more

APPENDIX E

FLORIDA INTERNATIONAL UNIVERSITY

MODIFIED HEALTH BELIEF MODEL QUESTIONNAIRE

Q1 The vaccination of a small child is the safest way to protect against illnesses:

- ○ the vaccinated child
- ○ The family members
- ○ The community
- ○ Unvaccinated children
- ○ All of the above

Q2 Yearly, childhood immunization saves

- ○ 580,000 lives
- ○ 2-3 million lives
- ○ 200,000 lives
- ○ 1000 lives

Q3 Routine vaccination administered during childhood does not protect in adulthood

- ○ True
- ○ False

Q4 Decreased vaccination in pediatric population:

- ○ Increases the risk of getting diseases like measles, polio, chickenpox
- ○ Decreases out of pocket expenses
- ○ Has little effects on healthcare costs
- ○ Does not affect the adult population

Q5 Declining vaccination rates increase children's susceptibility to diseases and may lead to disease outbreaks

- ○ True
- ○ False

Q6 Decreased vaccination can cause the resurgence of diseases that have been eradicated for years

- ○ True
- ○ False

Q7 Since 2020, there has been a global increase in routine childhood immunizations

- ○ True
- ○ False

Q8 Obstacles to vaccination can be:

- ○ Bad provider-patient relationship
- ○ Deficient of knowledge about vaccination
- ○ Parents not trusting the system
- ○ All of the above

Q9 Ways to increase compliance to vaccination are as follows except:

- ○ Set up reminders
- ○ Educate parents and family members about the benefits of vaccination
- ○ Develop a good patient-provider relationship through good communication
- ○ Training of medical and nursing students on vaccination
- ○ None of the above

Q10 The best technique to increase vaccination

Dispelling myths, rumors, religious convictions or worries about vaccination that discourage parents through good communication

- ○ Letting the parents seek advice from grandparents to inquire whether the child should get vaccinated
- ○ Giving the parents several websites to consult and telling them to come back once they made a decision
- ○ Place posters on vaccination all over the office for the parents to read

Q11 Doctors, nurses, and office staff play all critical roles in developing and upholding a practice-wide approach to effective vaccine communication and high immunization coverage

- ○ True
- ○ False

Q12 A mother brings her 2 months old for well visit. After you tell her that her baby is due for vaccines, she tells you that she has doubts about vaccines and wants to know more before deciding. What do you tell her?

- ○ I understand you. Even I sometimes have doubts
- ○ Vaccine is the safest way to protect your child. The side effects can be minor and are treatable
- ○ Take your time, go home, think about it, and come back after you made your decision
- ○ Please, you have nothing to worry about. Let me give your child the vaccine now

Q13 The main and most influential source of vaccination information for most people is

- ○ Healthcare Professionals
- ○ Any websites with information about vaccination since they are all reliable
- ○ Experienced and wise elders in the family
- ○ The clergy

Q14 While in the exam room, the child's grandmother tells the child's mother that none of her children were vaccinated and they're all healthy. What's your best intervention?

- ○ Ignore grandmother and turn only to mother to educate her about the benefits of vaccination
- ○ Tell the child's mother to ignore her mother because what she just said was stupid
- ○ Include grandmother in the education session about the benefits of vaccines
- ○ Politely, ask grandmother to step out of the room so you can talk freely to the mother

Q15 I am confident about helping parents stay compliant with their children's vaccination schedule:

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

Appendix F

FLORIDA INTERNATIONAL UNIVERSITY

CITI ETHICS CERTIFICATION

CITI PROGRAM

Completion Date 19-May-2021
Expiration Date 18-May-2024
Record ID 17609656

This is to certify that:

Francisco Brenes

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Basic/Refresher Course - Human Subjects Research
(Curriculum Group)
Social/Behavioral Human Research Course
(Course Learner Group)
2 - Refresher Course
(Stage)

Under requirements set by:

Florida International University

CITI
Collaborative Institutional Training Initiative

CITI PROGRAM

Completion Date 30-May-2023
Expiration Date 30-May-2026
Record ID 51983353

This is to certify that:

Berthe Dupervil

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Basic/Refresher Course - Human Subjects Research
(Curriculum Group)
Social/Behavioral Human Research Course
(Course Learner Group)
2 - Refresher Course
(Stage)

Under requirements set by:

Florida International University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?w1e057435-5219-4f1b-aef4-e0ee7ecbec90-5198335 3

Appendix G

FLORIDA INTERNATIONAL UNIVERSITY

CV

Florida International University

Doctor in Nursing Practice 01/2022 - Ongoing

Florida International University

Master of Science in Nursing 08/2020 – 07/2021

Florida International University

Certification on Opioid Use and Pain Management 08/2018- 04/2020

Medical School of State University of Haiti

Doctorate in Medicine 10/2003 – 12/2010