DEVELOPMENT AND EVALUATION OF A NURSE PRACTITIONER-DRIVEN HOME-BASED PRIMARY CARE ACCESS AND IMMUNIZATION INITIATIVE FOR ADULTS WITH AUTISM AND/OR INTELLECTUAL DISABILITY

An Evidence-Based Scholarly Project

Submitted to the College of Health Professions and Natural Sciences

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Requirements for the Degree

Doctor of Nursing Practice

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Title: Development and Evaluation of a Nurse Practitioner-Driven Home-Based Primary Care Access and Immunization Initiative for Adults with Autism and/or Intellectual Disability

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Depending on the severity of the impairment, individuals with autism spectrum disorder (ASD) and/or intellectual disability (ID) can have difficulty with traditional primary care office visits. The clinic environment is unfamiliar and overstimulating, and even if a clinic room can be adapted to provide less stimulation, individuals and their caregivers must still navigate overstimulating environments and waiting rooms. Regular primary care helps to ensure health maintenance, prevent illness, gain access to preventative services such as immunizations, and reduce the cost of healthcare overall. Telehealth is one option to eliminate the need to navigate the overstimulation of the clinic environment. However, these individuals can have difficulty understanding how to interact with a provider via telehealth and there is a loss of needed hands-on assessment. Similarly, immunizations and other preventative care are unable to be provided via this platform. The Centers for Medicare and Medicaid Services (CMS) Independence at Home (IAH) demonstration project yielded successful results in providing primary care to elderly individuals who were homebound. IAH providers were able to perform physical assessments as well as provide needed hands-on care such as immunizations and point-of-care testing for those who were unable to come to the clinic for care. Building upon this success, and following the plan-do-study-act model for continuous performance improvement, this project looked to bring home-based primary care (HBPC) to individuals who have difficulty coming into the clinic location due to overstimulation. Providing care in a familiar home environment allows for hands-on assessment and immunization administration in compliance with the Centers for

Disease Control and Prevention's (CDC) Adult Immunization Schedule (AIS). Over a period of six weeks, 32 individuals ranging in age from 19 to 78 were provided a HBPC visit and vaccine administration. Results showed a statistically significant increase in the rate of vaccinations. The time of the last in-person visit before the HBPC visit was collected. The data showed more than 28% had not had a physical assessment in over 12 months. Two individuals had never been seen in person in the adult practice.

Keywords: autism, intellectual disability, access to care, home-based primary care, adult immunization schedule.

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ABBREVIATIONS

ACIP - Advisory Committee on Immunization Practices

AIS - Adult Immunization Schedule

ARCC - Advancing Research and Clinical Practice Through Close Collaboration

ASD - Autism Spectrum Disorder

CDC - Centers for Disease Control and Prevention

CITI – Collaborative Institutional Training Initiative

CMS - Center for Medicare and Medicaid Services

CSHCN - Center for Special Health Care Needs

DDDS - Division of Developmental Disabilities Services

DNP - Doctor of Nursing Practice

EBP - Evidence-Based Practice

EMR – Electronic Medical Record

ED - Emergency Department

HBPC - Home-Based Primary Care

Hep A - Hepatitis A Vaccine

Hep B - Hepatitis B Vaccine

HPV - Human Papillomavirus

HHS - Department of Health and Human Services

HSRC – Human Subjects Review Council

IAH - Independence at Home

ID - Intellectual Disability

IHI - Institute for Healthcare Improvement

IRB – Institutional Review Board

MMR - Measles, Mumps, and Rubella vaccine

NP - Nurse Practitioner

PCP - Primary Care Provider

PCV20 - Pneumococcal Vaccine 20-Valent

PDSA - Plan, Do, Study, Act

PICOT - Population, Intervention, Comparison, Outcome, and Time

Tdap - Tetanus, Diphtheria, and Pertussis

U.S. - United States of America

CHAPTER ONE

INTRODUCTION

Problem Description

Defined by the World Health Organization (2019), primary care is a model of care that supports accessible, comprehensive, and coordinated person-focused care. Primary care aims to optimize population health and reduce disparities by ensuring equal access to care. Utilization of primary care is associated with better access to healthcare services, improved outcomes, cost savings, and mitigation of the negative effects of socioeconomic factors on health. Preventative services provided by primary care can help to prevent illness, also known as primary prevention, and lead to the identification of health problems earlier, also known as secondary prevention. One form of primary prevention is immunizations, which aid in preventing or reducing illness severity by stimulating the body's immune response. Barriers to primary care access reduce access to immunizations and other health maintenance.

The Advisory Committee on Immunization Practices (ACIP), in their October 2023 meeting, voted to recommend approval of the 2024 United States (U.S.) adult immunization schedule for people who are 19 years of age and older (Murthy et al., 2024a). This immunization schedule has been approved by the Centers for Disease Control and Prevention (CDC), the American College of Physicians, the American Academy of Family Physicians, the American College of Obstetricians and Gynecologists, and the American College of Nurse-Midwives. In their *National Adult Immunization Plan*, the U.S. Department of Health and Human Services (DHHS) (2019) listed barriers to adult immunization. Of the 11 barriers mentioned to make progress in adult immunizations, meet the Healthy People 2020 objectives, and eliminate disparities, two are directly related to access to care. These barriers include limited use of

evidence-based strategies to improve immunization uptake, such as reminder-recall and related systems, and lack or underuse of systems for identifying people who are due for immunizations (p.4). The Healthy People initiative is the federal government's prevention agenda for building a healthier nation through the identification of national health objectives (DHHS, 2010). Healthy People 2020 is the fourth iteration of the Healthy People initiative with the fifth iteration, Healthy People 2030, having been launched in August 2020. There are four goals for this decade one of which is to attain healthy, thriving lives and well-being, free of preventable disease, disability, injury, and premature death (DHHS, 2020). Access to immunizations would also be part of this goal.

Adults with autism spectrum disorder (ASD) and/or intellectual disability (ID) experience barriers to primary care due to reported heightened stress (Stein Duker & Goodman, 2022). One of the barriers identified in this study was sensory overstimulation from the physical environment leading to anxiety and emotional distress. While telehealth became mainstream during the COVID-19 pandemic there is limited research related to the impact of this form of healthcare delivery for those with ASD and/or ID (Ali et al., 2023). Individuals with lower cognitive functioning cannot participate in telehealth in a meaningful way and preventative care such as immunizations cannot be provided during a telehealth visit. Sun et al. (2022), in a study on home-based primary care (HBPC) visits by nurse practitioners (NP), showed an increase in health assessments, education, and care planning for those who are considered homebound. In a systematic review of the literature related to barriers and facilitators to primary care for people with ASD and/or ID, Doherty et al. (2020) found that reasonable adjustments such as providing home visits help to ensure these individuals are not excluded from primary health care.

The Doctor of Nursing Practice (DNP) project site, the Center for Special Health Care Needs (CSHCN), serves 1,200 individuals. HealtheRegistries®, a population health analytics program provided by the Cerner® Corporation, provides technology to track and manage quality measures to improve population health outcomes. The health system where this project was implemented uses Cerner® as the electronic medical record system. Data was obtained from HealtheRegistries for the rate of immunizations for this population for the 2023/2024 season. The data included tetanus, diphtheria, and pertussis (Tdap) immunization rate of 53.3%, measles, mumps and rubella (MMR) rate of 47.2%, human papillomavirus (HPV) immunization rate of 25.8%, pneumococcal immunization (PCV20) rate of 34.6%, hepatitis A (Hep A) immunization rate of 8.7%, and hepatitis B (Hep B) immunization rate of 25.8%. According to the adult immunization schedule published by the CDC, Tdap booster is recommended every 10 years or for wound management, HPV is two or three doses depending on age at initial vaccination, and for adults aged 19-64 with chronic health conditions, one dose of pneumococcal vaccine 20-valent (PCV20) (Center for Disease Control and Prevention, 2023).

This evidence-based practice (EBP) change looked to implement HBPC to increase access to primary care for adults with ASD and/or ID and improve adherence to the adult immunization schedule.

Rationale

Based on the success of the CMS IAH project to bring primary care to the home-bound elderly as well as the barrier of sensory overstimulation leading to a reduction in primary care for adults with ASD and/or ID, this project aimed to bring care directly to these individuals. Bringing care to where the individual is the most at ease and not overstimulated will help perform the care typically performed in the clinic setting. The Plan, Do, Study, Act (PDSA)

model for improvement originating from Walter Shewhart and Edward Deming's work, is a structure for iterative testing of changes to improve the quality of systems and is widely accepted in healthcare improvement (Taylor et al., 2014). This project aimed to add another location of care for our patients and the process was evaluated and changed as needed. The PDSA cycle facilitated this evaluation (Connelly, 2021). After a review of the literature, it was determined this EBP change would best be implemented following these steps for continuous evaluation of the process of HBPC being implemented.

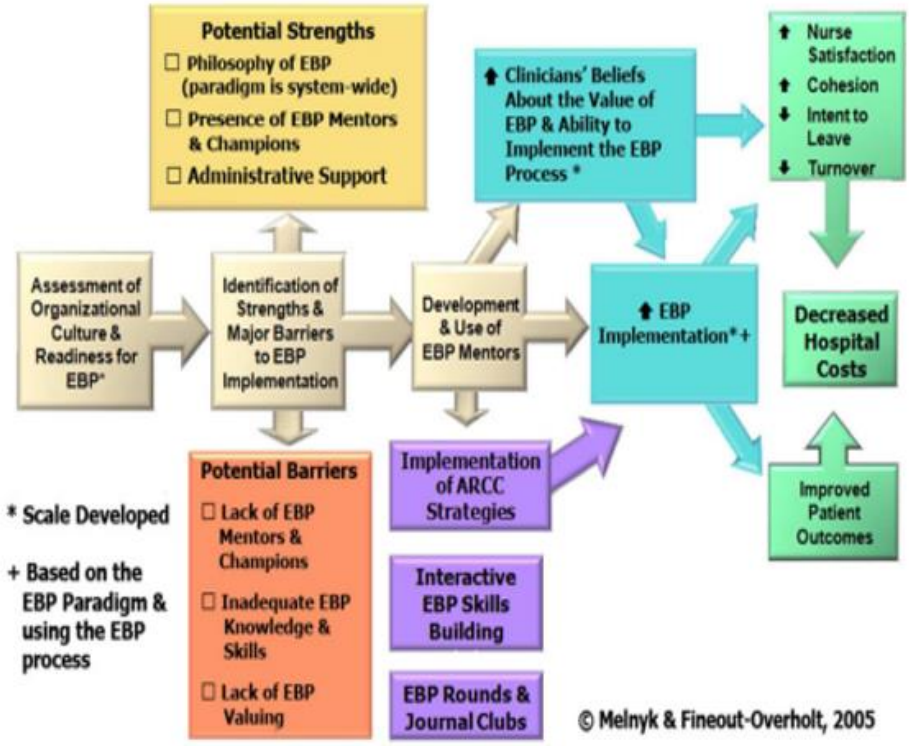
Evidence-Based Practice Model

An evaluation of the organization was performed before the selection of an EBP model. A strong culture of EBP was found in this three-time Magnet® recognized organization. The American Nurses Credentialing Center (ANCC) Magnet Recognition Program encourages excellence through leadership, scientific discovery, and dissemination and implementation of new knowledge (Lal, 2024). Support for this project was obtained through stakeholders in the organization including the DNP project advisor appointed by the organization to support EBP projects. The evidence-based practice model used by Wilmington University for DNP projects is the Ohio State University EBP Model. Originally conceptualized by Bernadette Melnyk in 1999, the Advancing Research and Clinical Practice Through Close Collaboration (ARCC) Model provides health systems and clinical settings with an organized framework to guide implementation for sustainable EBP (Melnyk & Fineout-Overholt, 2023). As seen in Figure 1, the ARCC model begins with the assessment of the organization's readiness and the identification of strengths and potential barriers to EBP. The use of mentors is an important part of the ARCC model to help guide the process and continue to lend support for EBP. This process

culminates in the increase of improved patient outcomes, decreased cost, and an increase in nurse satisfaction.

Figure 1

The Advancing Research and Clinical Practice Through Close Collaboration (ARCC) Model



Specific Aims

This project aimed to increase access to primary care and immunizations for individuals with ASD and/or ID who have difficulty getting care in a traditional clinic setting. The overall aim was to increase immunization administration following the AIS approved by the CDC for 2024.

Definition of Terms

The following conceptual and operational definition of terms were used throughout the project:

- *Autism Spectrum Disorder (ASD)* is defined as a developmental disability caused by differences in the brain. Individuals with ASD may behave, communicate, interact, and learn in ways that are different from most other people (Centers for Disease Control and Prevention, 2022a).
- *Immunization* is defined as a process by which a person becomes protected against a disease through vaccination (Centers for Disease Control and Prevention, 2021).
- *Intellectual Disability (ID)* is defined as limits to an individual's ability to learn at an expected level and function in daily life (Centers for Disease Control and Prevention, 2022b)
- *Primary care* is defined as a model of care that supports first-contact, accessible, continuous, comprehensive, and coordinated person-focused care (World Health Organization, 2019).
- *Telehealth* is defined as the use of electronic information and telecommunication technologies to support long-distance clinical healthcare (Health Resources and Services Administration, 2022).
- *Vaccine* is defined as a preparation that is used to stimulate the body's immune response against diseases (CDC, 2021).

Chapter Summary

Chapter one introduced the rationale behind utilizing HBPC to increase access to primary care and immunizations for individuals with ASD and/or ID who have challenges with clinic visits. The problem description, rationale, and specific aims of this EBP were presended. Next, the choice of the PDSA framework was described to guide this evidence-based DNP project through the ARCC model. Finally, a definition of terms was provided to help ensure the reader understands all the material presented in this manuscript. Chapter two will provide a detailed analysis and synthesis of the available knowledge following the four themes that emerged during the search for evidence to support this DNP project.

CHAPTER TWO

AVAILABLE KNOWLEDGE

Search Strategy

To procure the best available knowledge, a comprehensive electronic database search was performed to examine further how HBPC could be used as a solution for primary care and vaccination access in adults with ASD and/or ID. Databases searched included the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, the Medical Literature Analysis and Retrieval System Online (MEDLINE), Google Scholar, and the Cochrane Database. Key search terms were selected due to their direct relation to the stated population, intervention, comparison, outcome, and time (PICOT) question for this project and included: home-based medical care, home-based primary care, primary care at home, medical visits at home, adults, autism, intellectual disability, access to care, preventative services, telehealth, gaps in care, nurse practitioner home-based care, adult vaccine importance, vaccination, immunization, vaccine schedule. Inclusion criteria included full-text research studies addressing the PICOT question between 2019 and 2024 where full text was available in the English language and focused on adults with references included.

The PICOT question for this project was: In adults with ASD and/or ID who did not receive needed immunization(s), does HBPC compared to in-clinic visits impact immunization rates in 6 weeks? The goal of the literature search was to include high-quality, consistent, and patient-oriented clinical evidence utilizing the Advancing Research and Clinical Practice through Close Collaboration model (ARCC). Finally, references from the identified studies provided additional relevant articles for review. A total of 96 articles were found, with 26 of these articles being duplicates among the searched databases. Leaving 70 articles for full-text review, 48 of

those articles were excluded due to inappropriate setting, book chapter, opinion/editorial, theses, review article, pediatric population, abstract only, or inappropriate diagnosis for this project. This left 22 articles included in the literature review. The search schematic for this literature review can be found in Appendix A.

Literature Review

As a result of the extensive literature search, several themes were identified, including (1) access to primary care and preventative services; (2) barriers to care and telehealth services; (3) emergency department (ED) and hospital utilization; and (4) adult immunization schedule and vaccine disparity.

Access to primary care and preventative services

Access to primary care and preventative services is associated with better access to healthcare services, improved outcomes, cost savings, and mitigation of the negative effects of socioeconomic factors on health. For individuals unable to access primary care in the typical clinical setting, other solutions for bringing this care to the individual must be explored. One solution to help increase access to primary care is HBPC, meeting the individual where they are without the expectation that they come to a physical location for care. HBPC has been shown to improve access to care and preventative services in many studies that support this project.

Abrashkin et al. (2021) found that providing HBPC to older adults in an advanced illness management program (AIM) increased their access to primary care and preventative services. These participants were considered homebound for various reasons and unable to attend clinic visits. These individuals were able to benefit from a primary care provider (PCP) coming to their home and performing assessments, medication reconciliation, vaccine administration, and other preventative services they otherwise would not have been able to receive. In a similar yet larger

study, Kling et al. (2023) found that those in a HBPC group had a significant increase in primary care visits compared to controls. The study was designed as a longitudinal matched case-control study of 445 home-bound older adults where 117 were getting HBPC and 328 matched in the control group. The HBPC group also had increased access to multidisciplinary care such as social work and physical therapy.

Access to primary care has also been significantly impacted by the shortage of physicians who are going into the specialty. Using the State of Delaware as a focus state, Malayala et al. (2021) found that the number of primary care physicians providing direct care in Delaware had declined by approximately 6% from 2013 to 2018. The average wait time to see a PCP was 8.2 days in 1998 and as of 2018 was up to 23.5 days. Nurse practitioners are increasingly utilized to meet the growing demand for primary care, and this includes HBPC. Osakwe et al. (2020) found that NPs are now the largest type of primary care providers delivering home visits. Similarly, Zimbroff et al. (2021) performed a systematic review of 79 published articles looking at the provision of primary care in the home. Five primary themes were identified to include: the provision of HBPC, composition of HBPC teams, HBPC outcomes, telehealth, and emergency preparedness in HBPC. Looking at Medicare claims data from 2012 - 2013, 5200 PCPs completed more than 1.7 million HBPC visits (Zimbroff et al., 2021). Physicians and NP providers primarily provided these visits. In a systematic review evaluating the impact of HBPC provided by NPs, Sun et al. (2022) found that NP-driven HBPC increased access to primary care and preventative services for the home-bound elderly.

The diagnostic criteria for ASD range from support level 1 where an individual requires little support, level two where an individual requires substantial support, to level three where an individual requires very substantial support (Centers for Disease Control and Prevention, 2022c).

Assessment of an individual's intellectual disability is characterized by four severity levels, namely mild, moderate, severe, and profound with levels of support being needed based on IQ ranges for each of these levels (Kishore et al., 2019). It only stands to reason that individuals who require more support would have more difficulty in understanding the procedures of a clinic visit and become more anxious being in unfamiliar surroundings.

Maltais et al. (2020) in a descriptive study of 791 adults aged 15-82 with a diagnosis of ID found that those with more severe ID had an increase in disparities in being able to access primary care and preventative services. Given the success of HBPC in increasing access to primary care and preventative services for the home-bound elderly population, this option was also looked at as being an option for individuals with ASD and/or ID who have difficulty with traditional clinic-based provider visits.

Doherty et al. (2020) performed a systematic review and meta-analysis of 63 studies of individuals 14 years or older identified as having ASD and/or ID and found that the anxiety and stress of clinic spaces along with the wait time to be seen decreased access to primary care and preventative services. Communication styles also were shown to be a significant barrier as many healthcare providers are unable to take the time during a clinic visit to ensure needs are being met. Similarly, Malik-Soni et al. (2022), in a review of 248 peer-reviewed studies published in or after 2010 covering barriers to healthcare for individuals with ASD, found that individuals of all ages have a greater need for healthcare services but have less access to appropriate healthcare. Environmental barriers due to sensory sensitivities were found in many of the studies reviewed.

Shady et al. (2022) performed an integrative review of 28 articles published in 2006 and beyond looking at barriers and facilitators of healthcare access for adults aged 18 and older who had a diagnosis of ASD, ID, or cognitive delay. Failed use of appropriate accommodations led to

poor rates of preventative care. Sensory overload in the clinic space, long wait times, and providers who were not trained to care for individuals with these diagnoses were some of the reasons provided. Across all studies, preventative care was found to be challenging to both the provider and the adult, particularly in the case of invasive examinations such as gynecological exams, blood draws, and vaccinations. Finally, Gilmore et al. (2022) performed a meta-analysis of studies published from 2010 to 2020 of adults aged 18 or older with a diagnosis of ASD looking at the utilization of primary care and preventative services. These individuals may access primary care and preventative services as much as their non-ASD peers, but a limitation of this study is the degree of severity of those with ASD. A limitation mentioned was that those in the studies tended to be higher functioning.

Barriers to care and telehealth services

Healthcare disparities span a wide range of financial, geographic, cultural, and societal challenges. Disparities increase barriers to care and, unless mitigated, result in increased morbidity and mortality. Individuals unable to access care secondary to home-bound status are at increased risk for poor outcomes due to a lack of care, including preventative care. One of the studied solutions to help mitigate the barrier of home-bound status is HBPC. Federman et al. (2023) performed a random control trial of 229 adults aged 65 or older who required assistance with two or more activities of daily living (ADL). The HBPC group showed a decrease in barriers to care as these individuals had more access to care providers in the home. This study also included the HBPC group having access to social work visits and assessments of cognition and physical function.

Individuals with ASD and/or ID experience similar disparities with the addition of the actual physical space of healthcare providing an additional barrier. Overstimulation encountered

in the clinic setting, including crowded waiting rooms, wait time, unfamiliar and overwhelming exam rooms, and encounters with multiple people at various points of the visit, leads to an increase in anxiety and an escalation in harmful behaviors.

Mason et al. (2019), in a systematic review of six studies looking at barriers and facilitators for adults aged 16 and over with ASD, identified a diverse list of barriers to primary and preventative care, including sensory sensitivities. Malik-Soni et al. (2022) in a review of 248 peer-reviewed studies published in or after 2010 covering barriers to healthcare for individuals with ASD found that individuals of all ages have a greater need for healthcare services but have less access to appropriate healthcare. Environmental barriers due to sensory sensitivities were found in many of the studies reviewed. Similarly, Maltais et al. (2020), in a descriptive study of 791 adults aged 15-82 with a diagnosis of ID found that those with more severe ID had an increase in disparities in being able to access primary care and preventative services. This study was done with a comparator group of the general population. Having severe ID was seen as a barrier to care in the traditional clinic setting. Long wait times increased anxiety and this subsequently impaired communication and care even further. Even when a clinic has the advantage of an exam room with the needs of this population in mind, it is difficult to make every area of a medical practice appropriate to decrease sensory overload for these individuals.

The physical environment is not the only barrier for individuals with ASD and/or ID. Having access to providers who have experience in caring for those with these diagnoses can be just as important as the environment of care. In a systematic review published in 2020, Calleja et al. found that the overstimulation of the physical environment was a barrier to care for adults with ASD, and within the health system at large, a lack of providers experienced with ASD contributed to a barrier to care. Similarly, Shady et al. (2022) found sensory overload in the

clinic space, long wait times, and providers who were not trained to care for individuals with these diagnoses were barriers to care. This study concluded that access to providers who understand the nuances of care for individuals with ASD and/or ID and the time to provide adequate care in an appropriate setting is important to reduce the barriers to care.

Stein Duker and Goodman (2022) performed a descriptive study of 78 adults with ASD, along with caregivers, and primary care providers (PCP). Participants completed a survey designed to elicit information about current and previous primary care experiences. The questions were developed based on the issues identified in the literature including physical and sensory environments, scheduling, desensitization, and preparation of the PCP. Throughout the course of the study, 16 themes emerged and were categorized as either barriers or facilitators. Reported barriers for adults with ASD were communication difficulties, PCPs with a lack of specific knowledge for caring for an adult with ASD, and sensory overstimulation that led to anxiety and emotional dysregulation.

Telehealth services, while not novel, became the mainstay of care with the declaration of the COVID-19 pandemic in March 2020. Historically, telehealth had been used to connect a patient and provider when the two were separated by a significant distance and care may not have been available otherwise. However, to stop the spread of illness and continue to provide care to individuals, telehealth services were quickly adopted to provide care to individuals during this unprecedented time. While great for those who have access to and the ability to leverage technology, telehealth has been a great option to continue access to care; however, for those who do not, it has added additional barriers. Kalicki et. al. (2021) used a cross-sectional survey to conduct a descriptive study of 16 primary care physicians in a large HBPC program serving 873 home-bound adults. The study identified barriers to telehealth including those who have

difficulty with technology and no support person to help, those who do not have internet access, and the thought that there is a need to engage in innovative patient-centered strategies.

While there are observational aspects of the physical exam that can be performed during a telehealth visit, there are limitations to performing a hands-on physical exam. There can also be a feeling of a lack of connection with the provider, leading to difficulties in establishing a relationship via telehealth. Gordon et al. (2020), in a qualitative study of 27 adults with type 2 diabetes mellitus enrolled in the veterans' healthcare system, found that, while these individuals appreciated less travel time associated with telehealth visits, communication was a significant barrier. Those in the study shared that there was no ability to get a physical exam and barriers to establishing a relationship with the provider.

For individuals with ASD and/or ID, who have difficulty with the overstimulation of the clinic environment, telehealth did not provide the panacea it was hoped to become. In a mixed methods study, Ali et al. (2023) found that, in adults with ASD and their family members, barriers to care were increased with the use of telehealth due to the perception of technology and autistic communication styles. Telehealth did not improve access; instead, it added another barrier to care as communication during the visits was not felt to be productive and preventative care could not be provided. Individuals with the most significant impairment lack the ability to participate in a telehealth visit and can prefer to remain off-camera even further limiting any ability for an observational exam. In these situations, the visit is primarily with the caregiver and there is extraordinarily little, if any, interaction with the individual for whom care is being provided.

Emergency department and hospital utilization

Routine preventative care and accessible acute care can decrease the need for ED visits and hospitalizations. For individuals who have difficulty with access to primary care due to home-bound status, HBPC can provide the access they need and reduce this utilization as has been shown in the CMS IAH project. Abrashkin et al. (2021), in a quasi-experimental study of 2,000 participants of an IAH program in New York, found a decrease in ED utilization as well as hospital admissions. Similarly, Zimbroff et al. (2021) performed a systematic review of 79 published studies and found that HBPC patients had lower total Medicare, hospital, and skilled nursing facility costs. The review also found that HBPC patients had fewer ED visits overall. In the earlier mentioned study by Federman et al. (2023), the HBPC group had lower hospitalization rates, but there was no change in ED visits.

Nurse Practitioners are uniquely positioned to provide HBPC due to their ability to provide comprehensive care including health promotion, disease prevention, and management of acute and chronic conditions. The previous studies looked at care provided by both physicians and NP providers; however, there have been NP-specific studies looking at the effectiveness of HBPC. A systematic review of 14 unique studies of HBPC provided by NPs showed significantly reduced ED utilization and hospitalizations in all studies included (Sun et al., 2022). Osakwe et al. (2020) performed a systematic review of seven studies looking at the outcomes of NP-provided home visits and found significant reductions in ED utilization and hospitalizations.

Given the success of HBPC in reducing ED utilization and hospitalization in the home-bound elderly, it only makes sense that this intervention can also help those with ASD and/or ID. Gilmore et al. (2022), in a systematic review of 16 studies published from 2010 – 2020, found that adults with a diagnosis of ASD may be hospitalized as much as their non-ASD peers, but

there is an increase in ED visits. As stated previously, a limitation of this study is the degree of severity of those with ASD. Those in the studies tended to be higher functioning so these results could be different if looking at the rates of utilization in those with more severe limitations. A non-randomized control trial of 757 adults with 207 in the intervention group conducted by Mills et al. (2022) looked at the impact of HBPC on reducing hospitalizations in adults with ID living in supported residential settings. They found that those in the intervention group receiving HBPC showed a statistically significant reduction in hospitalizations than the control group who received standard clinic-based primary care.

Adult immunization schedule and vaccination disparity

Immunizations are the best protection from preventable diseases and have saved lives for over 100 years (Centers for Disease Control and Prevention, 2022d). The Advisory Committee on Immunization Practices (ACIP) adult immunization schedule for 2024 speaks directly to the vaccines needed by those aged 19 and older (Murthy et al., 2024b). Barriers to care as experienced by those with ASD and/or ID put them at risk for vaccine disparity and therefore more at risk of contracting preventable diseases. Castro et al. (2023), performed a large retrospective cohort study from 2016 – 2021, looking at the impact of disability status as a barrier to influenza vaccine. They found that the prevalence of vaccination was lower in adults with disabilities in all the years studied. The authors report that the disparity could be larger than reported given there was no correction for under-sampling for those with severe mental, cognitive, and communication limitations. Likewise, O'Neill et al. (2020), in a systematic review of 28 studies looking at immunization over the lifespan in those with physical and/or ID found similarities in vaccine disparity in those with a variety of disabilities.

Stephens and Kavanaugh (2020) published an expert opinion article discussing the data that supports the high rate of healthcare disparities among individuals with ID. They spoke particularly to access to vaccinations and advocated for vaccination screening at each primary care visit as the strongest predictor of vaccine acceptance. They also shared as an example that the rates of HPV vaccine in women with ID are often overlooked in this population. The goal of this project was to utilize HBPC to increase access to immunizations and preventative care for those adults with ASD and/or ID who struggle to get primary care in a traditional setting.

Chapter Summary

Chapter two presented the literature search strategy employed to support the PICOT question for this HBPC project. This included the databases searched, the search terms, and the limiters used to find the most current available knowledge. The literature's themes were identified with supporting articles referenced in support of the project. Chapter three will describe the contextual elements of the project, a thorough description of the intervention, an explanation of the study, measures, and analysis of the intervention, and finally the ethical considerations for this project.

CHAPTER THREE

METHODS

Context

While this evidence-based project took place in homes, all the individuals who were provided a visit were primary care patients at the Center for Special Health Care Needs (CSHNC) at ChristianaCare, Wilmington Hospital. A medical home for adults with pediatric-onset chronic disease, the practice was comprised of four physician providers, two advanced practice providers, two nurse case managers, two social workers, two medical assistants, one office assistant, and one site supervisor. There were a total of 1,200 patients seen in the primary care and specialty programs in the practice. The largest population of individuals were those seen for primary care.

Patient visits were provided in person in the clinic space and, since the COVID-19 pandemic in March of 2020, there was an option for video visits with any of the providers in the practice. Adults with autism and/or intellectual disability struggled with video visits, and they were primarily conducted between the provider and the caregiver of the adult. Video visits made assessment of the individual difficult and preventative care such as vaccine administration impossible. Assessment and vaccine administration also proved difficult for many individuals who found the clinic space to be overstimulating and anxiety-producing, leading to a less-than-optimal visit.

Interventions

Stakeholders within the Department of Medicine who provided leadership over the CSCHN were contacted and provided information regarding the proposed EBP project. The rationale and plan for the project to evaluate the effectiveness of a home-based primary care

program on access to primary care and vaccinations was described. Support for the project was obtained from these stakeholders and a team member was identified. The team member was the medical director for the CSHCN. Consent from the Institutional Review Board at ChristianaCare was obtained and determined to be free from human subject research. Application for human subjects review committee at Wilmington University was completed and approval for the EBP was obtained. A family nurse practitioner completed all the home visits.

Collaborating with the staff of the CSHCN, each of the physician providers was given a list of their primary care patients and asked to review the list to identify individuals who they felt would benefit from a home visit. They were asked to keep in mind those individuals who they knew struggled with increased anxiety and possible aggressive behavior when in the clinic. The individuals would also be those for whom a video visit was not productive and who may have been out of date with immunizations. Once a list of these individuals was compiled, a chart review was completed to gather demographic data, last in-person visit, and immunizations that were not up to date. Based on the time of year of the pilot as well as the available vaccines in our office which could be transported in a cooler, the vaccines offered for the visits included: Tdap, Measles, Mumps, and Rubella (MMR), HPV, Pneumococcal Vaccine 20-Valent (PCV 20), Hepatitis A (Hep A), and Hepatitis B (Hep B). The pilot was outside of the time frame for COVID-19 and Influenza vaccines, the Varicella vaccine needed to be kept frozen until administration, and the Zoster vaccine was not stocked in the clinic.

Since the visits were provided in the home and not in the clinic or via video visit, work was done with the billing department at ChristianaCare and templates were built into the electronic medical record so appropriate billing codes were used and attached to the appropriate location of care for each visit (American Medical Association, 2023). Templates for scheduling

the home visits were built according to the 6-week pilot. Once the templates were built, calls were made to the guardians of each of the individuals on the list to describe the pilot program to them and to answer any questions they may have had about the program. Discussions were had about the goal of the program to provide primary care in a less stressful environment and to provide necessary vaccines if this was desired. When the guardian agreed to participate, an appointment was scheduled over the 6 weeks and the medical assistants were asked to enter the visit into the schedule. Since some of the visits occurred without the guardian present like in the case of the individual being seen in a group home, permission to give any necessary immunizations was obtained during the phone call to introduce the program. This was standard for any vaccine that is also given in the clinic during an in-person visit. If the guardian declined vaccines, this was noted in the electronic medical record, and the vaccine was not offered during the visit and the individual was still scheduled for a home-based primary care visit. Care was taken to schedule visits according to ZIP codes to make the best use of travel between homes.

Calls were placed to the guardian or the group home manager the day before each home visit to confirm the appointment. Once in the home, the visit was conducted like any other primary care visit with vital signs taken including height and weight when the individual was agreeable, physical assessment, education of the caregiver, and vaccine administration when able to be performed based on guardian permission and/or cooperation of the individual. The location of the visit in the home was wherever the individual felt the most comfortable. Documentation of the visit and when appropriate, vaccine administration was documented in the electronic medical record similar to when the visit was conducted in the clinic or via video, and the visit was then appropriately billed.

While the visits were billed and income from the visits was attributed to the CSHCN, home visits would add increased costs not associated with in-clinic and video visits. A budget including the initial cost for equipment to measure vital signs and two possible point-of-care tests was created. The three-year budget also included mileage and tolls as well as the projected number of visits each year to show that the program would be lucrative even given the extra costs. This budget was imperative to show sustainability to stakeholders and can be found in Appendix B.

Study of the Interventions

The approach chosen to assess the impact of the intervention was a chart review to collect data regarding vaccines due before each visit. Data was collected in real-time during the pilot for vaccinations administered. A data collection tool was used to collect all of the pre-and post-visit data for each person visited. The data tool was also used to collect demographic data including age, race, ethnicity, and insurance. A range of time since the last in-person visit before the pilot was also collected on the data tool. The site of the visit including group home or private residence was also collected for comparison.

Measures

Demographic data including age, gender, race, ethnicity, and insurance coverage was collected. Vaccine data for each individual was available in the electronic medical record (EMR) and was linked with vaccine registries from Delaware, Maryland, Pennsylvania, and New Jersey. Once data from these registries was uploaded, this gave an accurate report of vaccines received and vaccines due. The evaluation of the home-based primary care pilot focused on the number of patients visited, the total number of vaccines recommended and given, and the breakdown of the reasons a recommended vaccine was not given. This data was analyzed to gauge the success of

the intervention to improve immunization rates through HBPC. Data specific to each vaccine was also evaluated with these same data points to compare any differences between vaccines offered. Secondary evaluations included the time between the last in-person visit and the ZIP code of each visit to show distribution across the State of Delaware.

Analysis

The independent variable for this project was the implementation of a home-based primary care program. The dependent variable was whether a vaccine was given when recommended. A two-tailed paired samples *t*-test was used to examine whether the mean difference between the total number of vaccines recommended, and vaccines given was significantly different from zero. Dependent sample *t*-tests are used when the measurements of a given dependent variable are paired and there is a single group of participants (Kim et al., 2022). The hypothesis was that HBPC would increase the number of recommended immunizations given with the null hypothesis that there is no difference between the immunizations recommended and those given. To further analyze the data, a chi-square test of independence was conducted to examine each of the six vaccines to determine whether the recommendation and administration were independent and differentiate the reasons the vaccines were not given. The chi-square test, a type of nonparametric test with no assumptions of distribution, is a simple method to analyze variables measured on the categorical level (Kim et al., 2022). The average of all reasons immunizations were not received was also used to show trends. Frequency and percentages were used to describe the time interval in scale since the last in-person visit before the home visit.

Ethical Considerations

Preparation for ethical study related to human subjects was facilitated by the completion of the modules in the Collaborative Institutional Training Initiative (CITI) on human subjects (see Appendix C). Institutional Review Board (IRB) approval was also obtained from ChristianaCare where the project was to take place and it was determined that requirements for full IRB review were not necessary (see Appendix D). As a final step in this process, an application to Wilmington University's Human Subjects Review Council (HSRC) was completed and the project was approved as being exempt and meeting the criteria as a quality improvement intervention (see Appendix E). Procedures were taken to ensure that individuals cannot be identified via names, digital identifiers, images, or detailed demographic information. Code name association data and information were securely and separately stored and participants were given codes which were securely stored separate from the project data tool. All data was maintained in password-protected electronic files and was planned to be maintained for three years past the completion of this research and then destroyed to render the data unusable and unrecoverable.

Chapter Summary

Chapter three presented the methods of the intervention including the context, intervention and study of the intervention, measures, analysis, and ethical considerations. A budget for the project for three years was presented as a path forward for sustainability. Explanations regarding statistical analysis were presented to detail how the results were evaluated. Using the stated statistical analyses, chapter four will provide the results of this evidence-based practice project and explain the outcomes. Chapter four also provides sample characteristics to give an understanding of the demographics of the population included in this project.

CHAPTER FOUR

RESULTS

Sample Characteristics

Prior to the initiation of the six-week pilot, 41 individuals were recommended for a HBPC visit. Attempts were made to contact all of the individual's guardians to explain the program and schedule a visit during the time of the pilot. In the end, there were 32 individuals seen for a HBPC visit. The most frequently observed age was 19-30 years (n = 20, 62.50%). The most frequently observed category of gender was Male (n = 20, 62.50%). The most frequently observed category of race was Caucasian (n = 22, 68.75%). The most frequently observed category of ethnicity was non-Hispanic/Latino (n = 30, 93.75%). The most frequently observed category of insurance was public Medicare/Medicaid (n = 27, 84.38%). The most frequently observed category regarding having HBPC visits in a group home was No (n = 20, 62.50%). Frequencies and percentages are presented in Table 1.

Table 1

Demographic Data for Participants

Variable	*n*	*%*
Age Range		
19-30 years	20	62.50
31-42 years	7	21.88
43-54 years	1	3.12
55-66 years	3	9.38
67-78 years	1	3.12
Gender		
Male	20	62.50
Female	12	37.50
Race		
Caucasian	22	68.75
Black	7	21.88
Other/Multi	3	9.38
Ethnicity		
Hispanic/Latino	2	6.25
Non-Hispanic/Latino	30	93.75
Insurance		
Public-Medicare/Medicaid	27	84.38
Private/Commercial	1	3.12
Both Public/Private	4	12.50
Group Home Resident		
Yes	12	37.50
No	20	62.50

Project Findings

Data collected was analyzed utilizing Intellectus Statistics (2023). Intellectus Statistics was an online computer software program with data entry and statistical analysis capabilities. To evaluate the question to be answered by this pilot, namely does HBPC compared to in-clinic visits impact immunization rates over six weeks in this population, a two-tailed paired samples *t*-test was conducted to examine whether the mean difference between total vaccines recommended and total vaccines given was significantly different from zero. The result of the

two-tailed paired samples *t*-test was significant based on an alpha value of .05, $t(31) = 6.02$, $p < .001$, indicating the null hypothesis can be rejected. This finding suggested the difference in the mean of total vaccines recommended and the mean of total vaccines given was significantly different from zero. The mean of the total vaccines recommended was significantly higher than the mean of the total number of vaccines given. The results are presented in Table 2. A bar plot of the means is presented in Figure 2.

Table 2

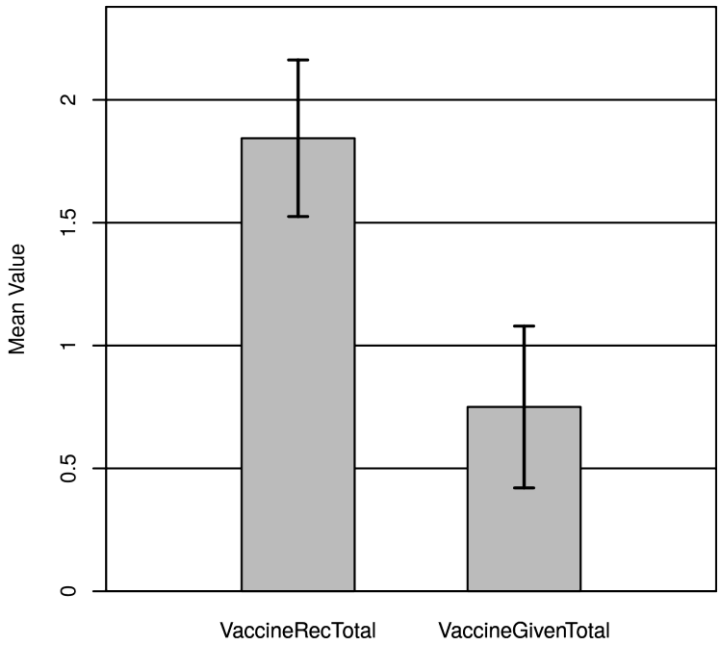
Two-Tailed Paired Samples t-Test for Total Vaccines Recommended and Total Vaccines Given

VaccineRecTotal		VaccineGivenTotal				
M	*SD*	*M*	*SD*	*t*	*p*	*d*
1.84	0.92	0.75	0.95	6.02	< .001	1.06

Note. N = 32. Degrees of Freedom for the *t*-statistic = 31. *d* represents Cohen's *d.*

Figure 2

The means of Total Vaccines Recommended and Total Vaccines Given with 95.00% CI Error Bars



Individual vaccine results

A Chi-square Test of Independence was conducted on each of the six vaccines to examine whether the recommended vaccine and vaccine given were independent. There were 2 levels in the recommendations: Yes and No. There were five levels in the Tdap vaccine given: Yes, No – Insurance denial, No - Behavior, No - declined, and Not applicable. There were four levels of vaccines given for the other five vaccines as Tdap was the only vaccine with insurance denial as a reason for the vaccine not being administered and there were no observations of vaccines not given for Hep A vaccine. Tables 3 through 8 present the results of the individual vaccines.

Table 3

Observed and Expected Frequencies of Tdap

	RecVaccTdap				
VacGivenTdap	Yes	No	χ^2	*df*	*p*
Yes	3[1.41]	0[1.59]	32.00	4	< .001
No – Insurance denial	6[2.81]	0[3.19]			
No - Behavior	1[0.47]	0[0.53]			
No - declined	5[2.34]	0[2.66]			
Not applicable	0[7.97]	17[9.03]			

Table 4

Observed and Expected Frequencies of MMR

	RecVaccMMR				
VacGivenMMR	Yes	No	χ^2	*df*	*p*
Yes	4[0.88]	0[3.12]	32.00	3	< .001
No - Behavior	1[0.22]	0[0.78]			
No - declined	2[0.44]	0[1.56]			
Not applicable	0[5.47]	25[19.53]			

Table 5

Observed and Expected Frequencies of HPV

	RecVaccHPV				
VacGivenHPV	Yes	No	χ^2	*df*	*p*
Yes	4[1.62]	0[2.38]	32.00	3	< .001
No - declined	8[3.25]	0[4.75]			
No - behavior	1[0.41]	0[0.59]			
Not applicable	0[7.72]	19[11.28]			

Table 6

Observed and Expected Frequencies of Prevnar-20

	RecVaccPrev20				
VacGivenPrev20	Yes	No	χ^2	*df*	*p*
Yes	3[0.75]	0[2.25]	32.00	3	< .001
No - declined	3[0.75]	0[2.25]			
No - behavior	2[0.50]	0[1.50]			
Not applicable	0[6.00]	24[18.00]			

Table 7

Observed and Expected Frequencies of Hep A

	VacGivenHepA				
RecVaccHepA	Yes	No	χ^2	*df*	*p*
Yes	2[0.12]	0[1.88]	32.00	1	< .001
No	0[1.88]	30[28.12]			

Table 8

Observed and Expected Frequencies of Hep B

	RecVaccHepB				
VacGivenHepB	Yes	No	χ^2	*df*	*p*
Yes	8[3.50]	0[4.50]	32.00	3	< .001
No - declined	4[1.75]	0[2.25]			
No - behavior	2[0.88]	0[1.12]			
Not applicable	0[7.88]	18[10.12]			

Figure 3 provides a graph depicting a summary of all vaccines and the reasons they were not given with corresponding percentages.

Figure 3

Reasons and Percentages for Each Vaccine Not Given

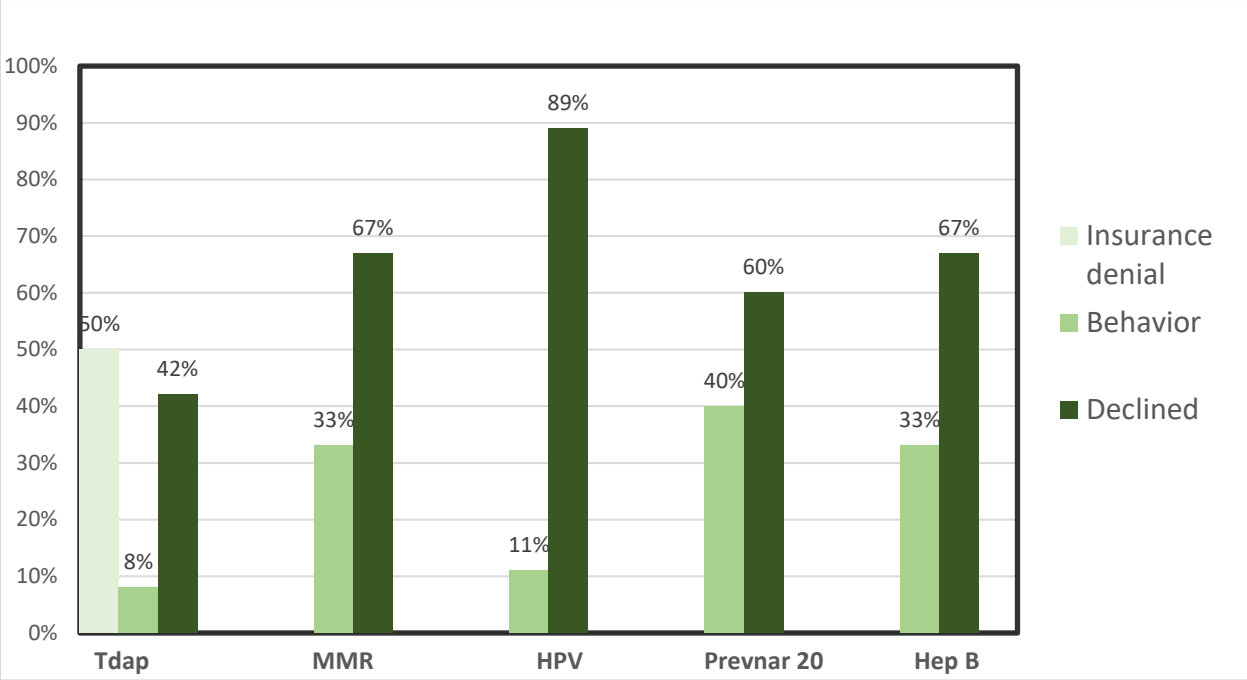
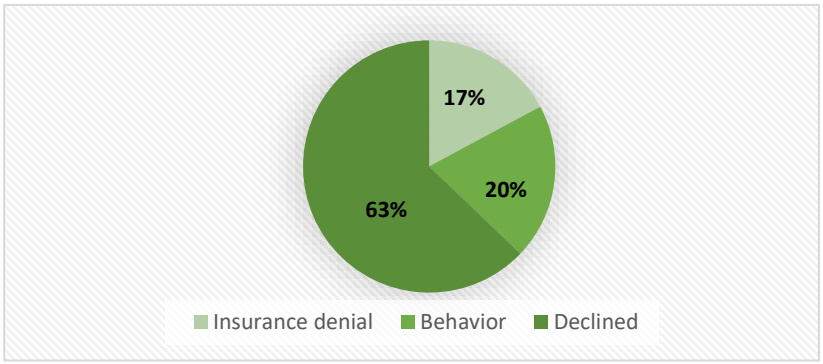


Figure 4 provides an overall total for the reasons a vaccine was not given as well as the corresponding percentages. This table represents a total of 35 reasons why a recommended vaccine was not given at the time of the HBPC visit.

Figure 4

Reasons and percentages for all vaccines not given



Overall immunization rates for the population of the CSHCN showed improvement over baseline by 3.9%. This result was directly related to the overall aim of the project and the PICOT question, namely an increase in immunization administration through providing HBPC. Table 9 details the percent change for each immunization.

Table 9

Increase in individual vaccine rates for the total population

Vaccine	*% pre-HBPC*	*% post - HBPC*	*% change post-HBPC*
Tdap	53.3	54.5	1.2
MMR	47.2	47.6	0.4
HPV	25.8	26.2	0.4
Prev20	34.6	35.4	0.8
Hep A	8.7	8.8	0.1
Hep B	25.8	26.8	1.0

Last in-person visit

Descriptive statistics were used to measure the number and percentages for the last in-person visit before the HBPC visit. The most frequently observed interval was 1-6 months with 7-12 months being the second most frequent interval. A total of 28.13 % had not been seen in over a year or more with two individuals having not been seen in person since transitioning to adult care. Table 10 details these results.

Table 10

Interval for Last In-Person Visit Before HBPC Visit

Variable	*n*	*%*
In-person visit interval		
1-6 months	18	56.25
7-12 months	5	15.62
13-18 months	3	9.38
19-24 months	3	9.38
24-50 months	1	3.12
No in-person visits	2	6.25

Chapter Summary

Chapter four detailed the demographic data for the individuals included in the pilot as well as the statistical results for the HBPC pilot, including the statistically significant improvement in vaccines administered when recommended. Further detail for each vaccine was presented, including the overall total percentages of the reasons why a vaccine that was recommended was not given. Finally, the in-person visit interval was reported. Chapter five will give the interpretations, limitations, and conclusions as well as the implications for advanced nursing practice and plans for project sustainability. In summary, chapter five will speak to the application of the American Association of Colleges of Nursing DNP eight essentials.

CHAPTER FIVE

DISCUSSION

Interpretation

Primary care is a model of care that supports accessible, comprehensive, and coordinated person-focused care (WHO, 2019). Primary care aims to optimize population health and reduce disparities by ensuring equal access to care. Preventative services provided by primary care can help to prevent illness, also known as primary prevention, and lead to the identification of health problems earlier, also known as secondary prevention. Immunizations are one form of primary prevention that aids in preventing or reducing illness severity by stimulating the body's immune response. Barriers to primary care access reduce access to vaccinations and other health maintenance. Healthy People 2030 was launched in August 2020. This decade had four goals: attaining healthy, thriving lives and well-being, free of preventable disease, disability, injury, and premature death (DHHS, 2020). Access to vaccinations would be part of this goal.

Adults with ASD and/or ID experience barriers to primary care due to reported heightened stress (Stein Duker & Goodman, 2022). While telehealth became mainstream during the COVID-19 pandemic, individuals with lower cognitive functioning cannot participate in telehealth in a meaningful way and preventative care such as immunizations cannot be provided during a telehealth visit. Reasonable adjustments such as providing home visits help to ensure these individuals are not excluded from primary health care (Doherty et al., 2020).

This intervention brought primary care and immunization administration to the homes of individuals who find it difficult to get care in a typical office setting. The data supports a statistically significant difference in the number of immunizations administered. Overall immunization rates for the population of the CSHCN showed improvement over baseline by

3.9%. This result was directly related to the overall aim of the project and the PICOT question, namely an increase in immunization administration through providing HBPC. HBPC also provided the opportunity for education related to the importance of vaccines when there was a declination and hands-on physical assessments for everyone, many of whom had not been seen in person for many years or even at all. The visits were well received by both the individual and their caregivers with requests for these to continue to be offered to facilitate access to care. The work done to initiate HBPC created a framework for scheduling and billing processes to sustain the intervention. Conclusions can be drawn that HBPC led to an increase in preventative care as was hypothesized at the project's outset. While the budget for the project did have more expenditures than visits performed in the office or via telehealth, there continued to be a profit shown for HBPC.

Limitations

One of the limitations of the project was the small sample size. More individuals were able to be seen than was initially projected, but the six-week time frame imposed on the pilot had to be strictly followed. While statistically significant, the overall vaccine data could have had more impact with larger numbers.

Travel time was also a limitation of the project. While every effort was made to consolidate visits to specific geographical areas, travel between homes did contribute to a decline in the number of individuals able to be seen in a day. While Delaware is not a significantly large state, those individuals who lived further away from the office location took the greatest amount of time and led to a decrease in the number of individuals who could be seen in a day. There were no restrictions placed on geographic location for this project, and all individuals who were

recommended for a HBPC visit were offered a visit. This was something to consider for the sustainability of HBPC in the practice.

Insurance posed a limitation specifically regarding the Tdap vaccine. Public health plans will not cover the Tdap vaccine unless it is related to the treatment of an injury. Since most of the individuals seen during this pilot were covered by public insurance, when they were recommended for a Tdap vaccine, it could not be administered during the visit. This would be an opportunity to work towards policy change for future visits.

Finally, due to the new location of care for the home visits which had to be created in the health system, a satisfaction survey was not automatically sent out for completion. This was not realized until after the pilot was concluded. Work is currently being done to send out a survey to those who were part of the pilot for ongoing performance improvement and sustainability.

Conclusion

Implications for Advanced Nursing Practice

Access to primary care has been significantly impacted by the shortage of physicians who are going into the specialty. Using the State of Delaware as a focus state, Malayala et al. (2021) found that the number of primary care physicians providing direct care in Delaware had declined by approximately 6% from 2013 to 2018. Nurse practitioners are increasingly utilized to meet the growing demand for primary care, and this includes HBPC. Osakwe et al. (2020) found that NPs are now the largest type of primary care provider delivering home visits. Nurse practitioners are uniquely prepared to provide HBPC due in part to their licensure to practice independently in the State of Delaware and many states across the country. Using this model of care, adults with ASD and/or ID who struggle with traditional office visits can gain access to all the health-related benefits of regular primary care.

Plan for Sustainability

Preparing for the HBPC project set a framework for scheduling and billing visits that take place in the home. A significant amount of work had to be done to set up these processes behind the scenes before any HBPC visits could be scheduled. Now that this framework is in place, schedules for HBPC visits can be added to the other visit types, including in-office and telehealth. Text appointment reminders were also built into this system to mimic other visit types. Meetings with the other providers in the practice including four physician providers and one other advanced practice provider have started to gauge interest in performing HBPC and continued identification of those individuals who would benefit from this type of visit. Policies are already in place for HBPC in the health system due to the Primary Care at Home Program, which is the evolution of the IAH demonstration project conducted by CMS. These policies have been updated to meet the specifics of the CSHCN program.

Application of the AACN DNP Essentials

The DNP Essentials are the foundational outcome competencies that are essential for all graduates of a DNP program regardless of specialty or focus. Published in 2006 by the American Association of Colleges of Nursing, these eight essentials must be present in programs conferring the DNP degree. The engagement hours for this project incorporated each of the eight essentials with the details as described in this section.

Essential I: Scientific Underpinnings for Practice

The scientific underpinnings of DNP education reflect the complexity of nursing practice at the doctoral level and prepares the graduate to integrate nursing science with knowledge from ethics, biophysical, psychosocial, analytical, and organizational sciences. This serves as the basis

for the highest level of nursing practice and ensures the DNP-prepared nurse can develop and evaluate practice approaches based on theories both from nursing and other disciplines.

Utilizing this knowledge and with a review of the literature for best practice, the DNP student was able to develop a strategy to enhance the health of this population of adults and utilize a delivery method that was more appropriate to meet their needs. Building on the success of the IAH program, HBPC utilized best practices and evaluated the outcomes for continuous performance improvement. Data from the project was collected, analyzed, and summarized to determine success and areas for improvement and project sustainment over time.

Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking

The practice of the DNP-prepared nurse must focus on the needs of a panel of patients or target populations and focus on the broader community. New care delivery models that are feasible within current organizational, political, cultural, and economic perspectives must be explored. Organizational and systems leadership are imperative to improve individual and overall outcomes. The DNP-prepared nurse should ensure accountability for the quality of health care and patient safety for the populations in which they work.

Meeting with current system leaders and identifying key stakeholders, the DNP student gained support for the project by highlighting the current disparities in the sub-set of the population being provided care. Keeping in mind fiscal responsibility, a budget was created to ensure the added cost of providing HBPC would not exceed the ability to maintain an adequate profit margin for care provided in the home. Advanced communication skills are imperative for gaining support for performance improvement processes, and the DNP student utilized these skills in gaining support and ongoing project milestones as the project progressed.

Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

Translation of research into practice and the dissemination and integration of new knowledge are key for the DNP-prepared nurse. The application of knowledge from diverse sources and across disciplines and populations to improve health outcomes has long been used to solve practice problems. The DNP-prepared nurse should be able to design, direct, and evaluate quality improvement methodologies to promote safe and effective patient-centered care.

The initial work for this project included an extensive literature review to understand best practices. Study of the IAH demonstration project provided an evidence-based intervention used in an elderly population and outcomes were used to support a similar HBPC program for adults with ASD and/or ID who have difficulty being seen in traditional clinic settings. The DNP student designed the intervention, directed the process, and evaluated the outcomes to ensure effective patient-centered care. To disseminate the results, the project and outcomes were shared at a system-wide performance improvement program, presented at a local nursing research meeting, and a state-level nurse practitioner conference.

Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care

Information systems and technology are used to support and improve patient care and healthcare systems. The DNP-prepared nurse needs to provide leadership concerning these technologies and how they can best be used to support quality care. Understanding how these systems are used to evaluate current care and provide data that can be utilized to evaluate and monitor outcomes of performance improvement is one of the significant roles of the DNP-prepared nurse.

The focus of this project was the intervention of HBPC to increase the rate of vaccinations. Understanding the integration of state vaccination registries into the electronic

medical record of each patient was pertinent for the DNP student to gather pre-intervention data. Facilitating communication with the health system's Information Technology department was also pertinent to gathering overall vaccine rates for the population as a whole. Execution of this data extraction ensured the project's outcomes could be relied on to be accurate and facilitate appropriate evaluation of the intervention. Pre-intervention work was done to create a template for scheduling and billing that was then included in the existing electronic structure to be used by the program moving forward.

Essential V: Health Care Policy for Advocacy in Health Care

Proactive engagement in the development and implementation of health policy at many levels including institutional, local, state, regional, and federal is an important role for the DNP-prepared nurse. Assuming a leadership role in the development, review, and revision of health policy is expected of a nurse who has achieved this terminal degree in the profession. The DNP-prepared nurse should be seen as a leader in working towards advocacy for social justice, equity, and ethical care in all healthcare venues.

Many adults with ASD and/or intellectual disability live in group living situations. In the state where this intervention took place, these group homes, while managed by different companies, are regulated by the Division of Developmental and Disabilities Services (DDDS). During the planning, intervention, and review of the data, the DNP student had regular meetings with the director of DDDS, as well as others in the office, overseen by the director to understand the policies as they relate to care provided to those who reside in group homes. A review of the current policies was completed and one of the policies related to documentation of an HBPC visit was updated to ensure appropriate documentation. Future meetings were planned to ensure the sustainability of the HBPC model for group home residents.

Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes

The DNP-prepared nurse requires excellent communication and collaboration skills to implement practice models and guidelines, health policy, and standards of care. Leadership of interprofessional teams is imperative for the analysis of complex practice and organizational issues. The DNP-prepared nurse can lead these teams to create change in complex healthcare systems.

Collaboration with multiple layers of leadership and other departments was pivotal to this project's success. Meeting with leadership at both the local department level and system level was necessary for the DNP student's project to be approved. IRB approval was needed to carry out the project in the health system. Billing specialists needed to be consulted to ensure the location of care was captured and access to appropriate billing codes. Information Technology department colleagues were enlisted to ensure the accuracy of the pre- and post-vaccination data. Policies specific to HBPC for the CSHCN were developed.

Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health

The DNP-prepared nurse has a foundation in clinical prevention and population health and this foundation enables the analysis of different forms of data for the development, implementation, and evaluation of prevention and population health. Utilization of sources both locally in their health system and nationally in publications such as those published by the US Department of Health and Human Services enables the DNP-prepared nurse to plan and implement programs that impact populations.

This project aimed to improve immunization administration in compliance with the CDC's AIS. The population was adults with ASD and/or ID who struggle with traditional in-

office primary care. The DNP student evaluated the vaccination data before project implementation and collected data during the intervention to evaluate the impact on the population. The project was in direct response to the need to improve vaccination rates in this population as well as improve access to primary care.

Essential VIII: Advanced Nursing Practice

Demonstration of advanced levels of clinical judgment, systems thinking, and accountability to provide evidence-based care and improve patient outcomes is a cornerstone of DNP education. The DNP-prepared nurse must be able to sustain therapeutic relationships and partnerships with patients and other professionals to ensure optimal care and excellent outcomes.

Providing care in a patient's home requires a level of trust for both the DNP student and the patient and caregiver. Throughout this project, the DNP student employed advanced clinical judgment on the safety of providing care in the home and assessment skills to ensure the appropriateness of care in the home location. Education was provided to each caregiver of the patient to be seen and all questions related to care were answered. Vaccine education was provided, and choices related to vaccine declination were respected. An increase in vaccinations, especially for those who live in congregate living such as group homes, leads to greater safety and wellness for the entire group. Evaluation of the HBPC project was done with a plan for sustainability working within the current healthcare delivery system.

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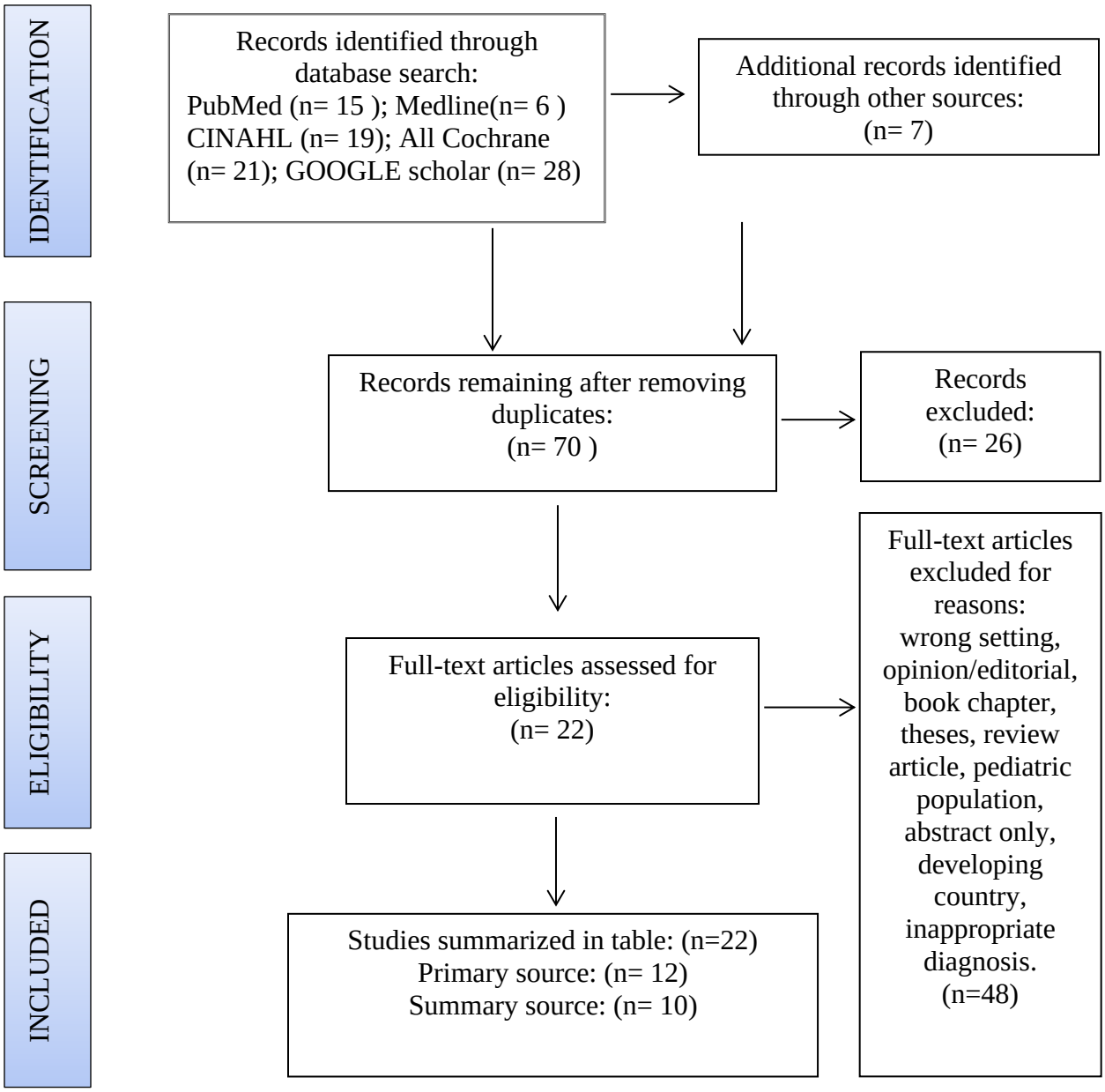
Appendix A

Search Schematic

EBP question: In adults with autism and/or intellectual disability who have difficulty with in-clinic visits, how does home-based primary care (HBPC) compared to in-clinic visits impact access to primary care and immunizations?
Keywords: home-based medical care, home-based primary care, primary care at home, medical visits at home, adults, autism, intellectual disability, access to care, preventative services, telehealth, gaps in care, nurse practitioner home-based care, adult vaccine importance, vaccination, immunization, vaccine schedule
Years: 2019-2024; Limiters: full text, English, peer-reviewed, adults, references



Appendix B

Project Budget and Breakdown

Nurse Practitioner-Driven HBPC Access and Immunization Initiative 2024-2026

Income

	Item	Per Unit	Proposed 2024 (50 visits)	Proposed 2025 (100 visits)	Proposed 2026 (150 visits)
	Home Visit - Moderate Complexity (99349)	$355.00	$8,875.00	$17,750.00	$26,625.00
	Home Visit - High Complexity (99350)	$495.00	$12,375.00	$24,750.00	$37,125.00
	Vaccine Administration	$12.97	$648.50	$1,297.00	$1,945.50
	Point of Care Glucose	$5.00	$125.00	$250.00	$375.00
	Point of Care Urinalysis	$24.00	$600.00	$1,200.00	$1,800.00
	Total Income	$891.97	$22,623.50	$45,247.00	$67,870.50

Expenses

	Item	Per Unit	Proposed 2024	Proposed 2025	Proposed 2026
	Nurse Practitioner	$63.90	$1,597.50	$3,195.00	$4,792.50
	Physician	$120.00	$3,000.00	$6,000.00	$9,000.00
	Start-Up Equipment Costs		$1,481.16	$0.00	$0.00
	On-going Equipment Costs		$0.00	$157.97	$157.97
	Milage Reimbursement	$0.67	$67.00	$100.50	$134.00
	Toll Reimbursement	$11.00	$220.00	$440.00	$660.00
	Expenses	$195.57	$6,365.66	$9,893.47	$14,744.47
Total Profit			$16,257.84	$35,353.53	$53,126.03

Start-Up Equipment Costs = Urinalysis Strips, Glucometer Kit, Glucometer Test Strips, Lancets, Thermometer and Probe Covers, Oximeter, Blood Pressure Manometer with Assorted Cuffs, Portable Scale, Otoscope, Ophthalmoscope, Gloves, Masks, Bandaids, Guaze, Hand Sanitizer

On-going Equipment Costs = Urinalysis Strips, Glucometer Test Strips and Lancets, Thermometer Probe Covers, Otoscope Covers, Gloves, Masks, Bandaids, Guaze, Hand Sanitizer

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Zip Recruiter. (2024). Nurse practitioner salary in Delaware. https://www.ziprecruiter.com/Salaries/Nurse-Practitioner-Salary--in-Delaware#Hourly

Item	Per Unit	Proposed 2024	Proposed 2025	Proposed 2026
Milage	$0.67	100 miles	150 miles	200 miles
Tolls	$11.00	$220.00	$440.00	$660.00
Cost of supplies -				
Urinalysis Strips $11.00 per 100	$0.11	$11.00	$11.00	$11.00
Glucometer kit	$15.00	$15.00	$0.00	$0.00
Test strips $15.00 per 25	$1.66	$15.00	$30.00	$30.00
lancets $13.00 per 1000	$0.77	$13.00	$0.00	$0.00
Thermometer	$342.63	$342.63	$0.00	$0.00
Thermometer probe covers	$0.15	$7.50	$3.79	$3.79
Pulse Oximeter	$63.48	$63.48	$0.00	$0.00
Blood pressure cuff (with different sized cuffs)	$111.05	$111.05	$0.00	$0.00
Portable Scale	$20.00	$20.00	$0.00	$0.00
Otoscope	$220.00	$220.00	$0.00	$0.00
Otoscope covers	$0.06	$51.00	$0.00	$0.00
Ophthalmoscope	$511.50	$511.50	$0.00	$0.00
Gloves $45.00 per 250	$5.55	$45.00	$90.00	$90.00
Masks $20.00 per 100	$5.00	$20.00	$20.00	$20.00
Bandaids $32.00 per 200	$6.25	$32.00	$0.00	$0.00
Hand Sanitizer (8oz)	$3.00	$3.00	$3.00	$3.00
Total	$1,317.88	$1,701.16	$597.79	$817.79

Appendix C

CITI Training Certificate

CITI PROGRAM

Completion Date 09-Sep-2022
Expiration Date 08-Sep-2024
Record ID 43124650

This is to certify that:

Mary Gant

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Human Research
(Curriculum Group)
Group 1. REQUIRED
(Course Learner Group)
2 - Refresher Course
(Stage)

Under requirements set by:

ChristianaCare

CITI
Collaborative Institutional Training Initiative

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

Generated on 28-Dec-2023. Verify at www.citiprogram.org/verify/?wc57241c1-b2a6-44f0-bdbf-53fbb7c460cd-43124650

Appendix D

ChristianaCare IRB Approval Letter

December 14, 2023,

To: Mary A Jones-Gant, FNP-C

Re: In adults with autism &/or intellectual disability does home-based primary care vs standard clinical visits affect access to care and preventative services

Dear Mary A Jones-Gant,

We have reviewed the information you submitted to the IRB/HRP Office regarding the above referenced project.

Based on the information you provided, the project as submitted on December 6th, 2023, does not meet the federal definition of research in accordance with 45 CFR 46.102(l) and therefore does not require review by the ChristianaCare Institutional Review Board (IRB).

In the future, if changes are made to this project, please notify the IRB/HRP Office immediately so a determination can be made if IRB review is necessary at that time.

If you have any questions, please call the IRB/HRP Office at 302-623-4983 or email IRBOffice@christianacare.org

Sincerely,

Rosymar Magana, MPH, CHES, CIP
Research Education Specialist
Human Research Protection Office (HRPO)
Christiana Care Institutional Review Board (IRB)

Appendix E

Wilmington University HSRC Approval Letter

WILMINGTON UNIVERSITY™
HEALTH PROFESSIONS & NATURAL SCIENCES

February 28, 2024

Mary Jones-Gant

Dear Mary,

Wilmington University's Human Subjects Review Committee (HSRC) is pleased to inform you that your Doctor of Nursing Practice project proposal ***Development and Evaluation of a Nurse Practitioner-Driven Home-Based Primary Care Access and Immunization Initiative for Adults with Autism and/or Intellectual Disability*** was reviewed on ***February 28, 2024.*** The project was categorized as ***Exempt*** and meeting the requirements of a quality improvement intervention. Your signed HSRC form is attached. Now that your DNP project has been approved by the HSRC, there are multiple elements with which you must comply. Wilmington University adheres strictly to these regulations:

1. You must conduct your DNP project exactly as it was approved by the HSRC.
2. Any additions or changes in procedures must be approved by the HSRC before they are implemented.
3. You must notify the HSRC promptly of any events that affect the safety or well-being of subjects.
4. You must notify the HSRC promptly of any modifications to your DNP project or other responses that are necessitated by any events reported in items 2 or 3.
5. Your approval is provisional if you require Institutional Review Board approval from your organization. Once organizational approval has been obtained, please submit your signed approval and completed IRB application to DNP Administrative Assistant via email.

The HSRC may review or audit your project at random or for cause. In accordance with Wilmington University policy, the HSRC may suspend or terminate your DNP project if your project has not been conducted as approved and/or if other difficulties are detected.

While not under the purview of the HSRC, DNP students are responsible for adhering to US copyright law when using existing scales, survey items, and other works in the conduct of research/DNP projects.

In conclusion, you have developed an interesting evidence-based practice project aligned with the AACN DNP Essentials (2006). This is an important project for healthcare practices now and in the future. Best wishes for continued success.

Sincerely,

Angela Herman, DNP, RN
HSRC Committee Representative
Chair, Health Sciences Program
College of Health Professions and Natural Sciences

Kathryn Leach, DNP, CPNP-BC
Chair, DNP Program
College of Health Professions and Natural Sciences

COLLEGE OF HEALTH PROFESSIONS AND NATURAL SCIENCES
320 N DuPont Hwy, New Castle, Delaware 19720