INCREASING RECOMMENDED VACCINES

INCREASING RECOMMENDED VACCINES IN SCHOOL BASED HEALTH CENTERS

by
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Increasing Recommended Vaccines in School Based Health Centers

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# TABLE OF CONTENTS

Abstract .......................................................................................................................................... 5  

Acknowledgements ....................................................................................................................... 6  

Introduction ..................................................................................................................................... 7  

Background and Significance ......................................................................................................... 8  
  
  Expanded Problem .................................................................................................................. 9  
  
  PICO Question ...................................................................................................................... 10  

Review of Literature ..................................................................................................................... 11  

Theoretical Framework .................................................................................................................. 14  

Methodology ................................................................................................................................... 15  
  
  Design .................................................................................................................................... 15  
  
  Setting ................................................................................................................................... 15  
  
  Sample ................................................................................................................................... 16  
  
  Variables ................................................................................................................................ 16  
  
  Research Procedures .............................................................................................................. 18  
  
  Data Collection ...................................................................................................................... 20  

Ethical Considerations .................................................................................................................. 20  

Data Analysis ................................................................................................................................ 21  

Results ........................................................................................................................................... 22  
  
  Quantitative ............................................................................................................................ 22
TABLE OF CONTENTS

Qualitative.......................................................................................................................................................... 25

Discussion............................................................................................................................................................. 29

Application of Theoretical Framework..................................................................................................................... 32

Strengths ..................................................................................................................................................................... 33

Limitations............................................................................................................................................................... 34

Implications for Practice ........................................................................................................................................ 35

Conclusion ............................................................................................................................................................... 35

References................................................................................................................................................................. 37

Table 1. Demographic Characteristics of Study Participants ................................................................. 44

Table 2. Types and Necessity of Vaccines ................................................................................................. 45

Table 3. Chi-square Test of Independence for Dependent Variables .................................................... 46

Table 4. Parent’s Perceptions with Supporting Quotes ........................................................................ 47

Appendix A. Kaleida Vaccine Consent for Routine Practice Control Group ........................................ 48

Appendix B. Example of VIS Sheet .................................................................................................................. 49

Appendix C. Letter to Parents and Consent for Intervention Group ..................................................... 52

Appendix D. Data Collection Tool Control Group .................................................................................... 567

Appendix E. Data Collection Group Intervention Group ........................................................................... 568

Appendix F. Parent Structured Interview Guide ....................................................................................... 569

Appendix G. Second Parent Structured Interview Guide ........................................................................... 60
TABLE OF CONTENTS

Appendix H. University at Buffalo Internal Review Board Determination Letter ...................... 61

Appendix I. White Paper............................................................................................................... 62
Abstract

**Problem:** Despite the availability of vaccines, over 45% of students in a SBHC were lacking ACIP recommended vaccines.

**Purpose:** To implement a two-step intervention in a SBHC to increase the number of returned vaccine consents and ascertain parental perceptions on SBHC immunization practices.

**Background:** SBHCs are an ideal setting to provide easily accessible, cost-effective immunizations for students. In a SBHC, the biggest obstacle to providing immunizations is obtaining consent because most children are unaccompanied by their parents.

**Theory:** The Model for Change to Evidence-Based Practice guided this project.

**Methods:** Mixed methods design. Descriptive, cross tabulations and chi-square analyses were utilized for quantitative data. Structured interviews were analyzed through an inductive content process. For purposes of this study, a returned consent indicated a completed immunization.

**Results:** A significant relationship between the two-step intervention and an increased number of returned immunization consents was found ($\chi^2 = 5.143$, $p = .023$). No other statistically significant relationships were noted in whether the student was fully immunized or who immunized the student. Three themes emerged from the structured interviews.

**Implications:** APNs are needed to provide the leadership to advocate for the improvement of evidence-based patient outcomes, especially in racial and economic disparate populations.
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Pediatric immunizations have been one of the best methods to prevent and eradicate infectious diseases since their inception. The World Health Organization (WHO) regards immunizations as one of the most successful and cost-effective health care interventions worldwide (WHO, 2017). In the United States (US), vaccines have been estimated to prevent 12,000,000 illnesses, 800,000 hospitalizations, and 28,000 premature deaths each year from vaccine-preventable illnesses (Whitney, Zhou, Singelton, & Schuchat, 2014). However, despite their overwhelming success, immunization coverage has remained stagnant in American schoolchildren in the past decade (Child Trends Databank, 2015).

The Centers for Disease Control (CDC) directs the immunization schedule for both children and adults based on the recommendations of the Advisory Committee on Immunization Practices (ACIP). Although these recommendations are recognized as the “gold standards” for pediatric immunization guidelines, not all of the recommended vaccines are required by school districts for school attendance. In the US, each individual state dictates their state’s school immunization requirements (New York State Department of Health [NYSDOH], 2016). Compliance to the NYS school required vaccines is estimated to be between 85.4 to 97.4% (CDC, 2016a).

However, compliance rates for immunizations that are recommended, but not required for school attendance are much lower. For example, in NYS, only 62.3% of adolescents are immunized for Human Papillomavirus (HPV) (CDC, 2016b). The Healthy People 2020 goal is to improve adolescent compliance rates to 80% for all of the ACIP recommended vaccines (Office of Disease Prevention and Health Promotion [ODPHP], 2017). Schools are an optimal setting to provide these recommended vaccines to students who are under-immunized (Perman, et al., 2017).
Background and Significance

In some communities, school based health centers (SBHCs) are available. A SBHC is a comprehensive health care clinic within a school that provides students with health care services aimed at prevention, early identification, and treatment to promote student success (Health Resources and Services Administration [HRSA], 2017). These clinics combine high quality health care within an educational institution, to provide health benefits to the children they serve. Immunizations are an important component of preventative care in pediatrics and especially at SBHC’s. Currently, in the US there are over 2,000 SBHCs providing health care to approximately 790,000 students (HRSA, 2017).

A needs assessment was done in the SBHC at Buffalo Public School (BPS) #89 to determine the number of students who were lacking one or more of the ACIP recommended vaccines. The current enrollment for BPS #89 SBHC for the end of school year 2016-2017 was 568 students, or 84% of the students attending BPS #89 (New York State Department of Health, 2017). All students in grades 6 through 8 for the 2017-2018 school year, were screened by reviewing their New York State Immunization Information System (NYSIIS) registry and students were found to be 50-72.7% under-immunized for their age.

In the BPS #89 SBHC, the needs assessment further explored parents, teacher’s aides, and teacher’s opinions on the current consent form. The consent form is a system-wide form that is designed for face-to-face contact with parents in primary care clinics or within the hospital. This needs assessment determined that the intended purpose of the consent form was often misinterpreted. According to the Flesch Ease Readability Formula (2017), the consent form is written on a grade 12 reading level. In addition, parents were expected to interpret the form, at home, without the benefit of a health care provider. The Agency for Healthcare Research Quality
(AHRQ) of the US Department of Health and Human Services (USDHHS) has determined the average reading level of an adult is at a grade 8 to 9 reading level, and written materials should be geared towards a fifth grade level (USDHHS, AHRQ, 2016). In the city of Buffalo, however, one in three adults is reading below a fifth grade reading level (Community Foundation for Greater Buffalo, 2018).

It has been determined that the current practice of sending out and following up consents and Vaccine Information Statements (VIS) to students utilizes approximately 2.8 hours per week of nursing time in each school. Costs for a registered nurse at five years of experience is about $36.80 per hour (Kaleida Health, 2016). Thus, the nursing time is currently costing $103.04 per week for 39 weeks of a school year, which equates to $4,018 per school year. A change in the vaccine consent process can potentially lower these costs and improve patient outcomes. This would permit the nurses to be able to spend more time providing other school nursing responsibilities such as vision and hearing screenings, health education and first aid services.

**Expanded Problem Statement**

Currently, SBHCs stock all of the ACIP recommended vaccines. Students who are lacking recommended vaccines are spending their entire school day directly down the hall from these clinics where these vaccines are stored. Despite the availability of vaccines, the Healthy People 2020 adolescent immunization goals are not being reached. The problem that exists was not one of accessibility, convenience, cost, or lack of insurance. The problem that exists was merely one of process.

The Advance Practice Nurse (APN) recognized a need for a process improvement. The current process of sending home consents was time-consuming and the consents were not easy to comprehend. Based on evidence from a literature review, a change in process that
incorporated a more parent-friendly consent, a reminder, and interviews to gain more insight into the parent perspective was necessary. This process improvement was designed so that this process could not only be implemented, but also measured and analyzed to determine the best practice for the SBHC. The APN has the unique skills to recognize the need for change and transform evidence-based interventions to improve patient outcomes.

**Purpose**

The purpose of this capstone project was to implement an intervention in a SBHC to increase the number of returned parent’s immunization consents, and to ascertain parent’s perceptions on SBHC immunization practices.

**PICO Question**

For students of the SBHC at Buffalo Public School (BPS) #89, does a two-step intervention, as compared to standard practice (immunization consents sent home with the student) increase the number of returned parental consents to the SBHC?

**Population:** Parents of students who are enrolled in the SBHC at BPS #89 and are lacking one or more recommended vaccines

**Intervention:** Two-step intervention (Step 1- a short parent letter attached to the immunization consent and VIS, and then followed by Step 2- a mailed reminder to parents, if Step 1 is not returned)

**Comparison:** usual practice (sending immunization consents with the student to give to their parent)

**Outcome:** Increase in the number of returned parental consents for vaccines to SBHC, and identification of parent’s attitudes, feelings, about immunization practices and processes in the SBHC.
Review of Literature

SBHC

SBHCs can be a key place to deliver vaccines, permitting easy access and availability to students within their schools (Williams et al., 2012). In a SBHC study by Eldred et al. (2015), this setting was found to be a realistic, replicable and convenient way to increase vaccination rates. SBHCs are an important vaccination resource, particularly for uninsured and economically disadvantaged adolescents who may have limited access to vaccination (Daley et al., 2009). Targeted students can be easily reached while attending school in a timely and cost-effective way (Vandelaer & Olaniran, 2015). In a study by Crocker, Porter-Jones, McGowan, Roberts, and Cottrell (2012), when vaccines were available, higher vaccine uptake was consistently found in schools as compared to general practice. In addition, parents most often chose vaccination in school for their child when it was offered. SBHCs have demonstrated the potential to increase vaccine uptake of recommended vaccines, such as HPV (Altenhofen & Olney, 2016). In a survey by Gargano et al. (2015), parents of 686 students were found to be supportive of school-located vaccine clinics as a setting for recommended adolescent vaccines. School nurses are in a position to influence vaccination compliance in their students of all ages, but most especially in adolescents because they may be the most trusted health care provider that adolescents routinely encounter (Swallow & Roberts, 2016).

SBHCs are unique in that the majority of health care services are provided for students unaccompanied by a parent. Routinely, the school nurse reviews the student’s immunization records to determine if the student is fully vaccinated for their age. If a student is recognized as lacking a vaccine, that student receives a written consent and a copy of the VIS to take home to their parent. The VIS contains information such as the risks and benefits about the individual
vaccine and are geared toward parents (CDC, 2017). Once the student returns the signed consent form, the SBHC can vaccinate the student with minimal interruption to their school day.

Despite free and easily accessible immunizations within the SBHC, obtaining the parent’s written consent remains difficult. According to Moss et al. (2014), 76% of school nurses identified the most common barrier to vaccination in school health centers was failure of students to return consents. In the Eldred et al. (2015) study, only 10.9% of students returned written parental consents. There is a need for additional research to examine effective school-based strategies that will be most beneficial and cost-effective in maximizing the ACIP recommendations (Cawley, Hall, & Rousculp, 2010).

Reminders

Several suggestions to increase the immunization coverage in patients include screening immunization records prior to each patient visit, screening immunization records of siblings of patients, keeping clinic staff up-to-date on current recommendations, and having vaccines consistently available to administer (Immunization Action Coalition, 2017). The CDC (2015) recommendations include using recordkeeping with immunization information systems, provider recommendations and reinforcement, reminders to patients and/or parents, as strategies to maintain high immunization levels.

Many different interventions have been found effective to increase vaccine uptake in school-age children with varying degrees of effectiveness. Education, surveys, recalls, reminders and designing parental consent forms to be brief and easy to understand have been shown to increase the number of returned consent forms (Cawley, et al., 2010). The findings of a study by Whelan et al. (2014), found that public health nurses recognized both reminder calls for parental consents and teacher thank you notes significantly increased HPV immunizations in schools.
Open communication between health care providers and parents, regarding disease risks and vaccine benefits is also recognized as an effective strategy for increasing vaccine uptake (Dorell, Yankey & Strasser, 2011). Wilson, Sanchez, Blackwell, Weinstein, and Amin (2013) concluded that mailing consent forms, in addition to sending them home with students, making them available at the main office, and on the district website, were effective strategies to improve return of parental influenza consent for an influenza campaign.

The use of recalls and reminders versus standard of care, demonstrated an increased vaccine uptake of 66% in a randomized control study on sixth grade boys in Denver (Kempe et al., 2012). The cost of SBHC recalls ranged from $1.12 to $6.87 per student immunized (Kempe et al., 2012). According to Allison et al. (2010), the optimal strategy for improving return of parental consent may vary according to each school’s resources, technology access, and needs specific to the parents of the school. Strategies to increase return of parental consents include getting verbal permission, mailing letters, and capturing parents when they are present at school (Eldred et al., 2015). A multi-faceted approach was advised to improve uptake of HPV vaccination in a school-based setting in a minority ethnic population (Batista Ferrer, Trotter, Hickman, & Audrey, 2015).

**Health Literacy**

Health literacy in pediatrics is geared towards parents, and is defined as the capacity to understand basic health information in order to make informed decisions (American Academy of Pediatrics, 2017). Health literacy is directly related to one’s level of education, and 75% of the adults without a high school diploma are at the below basic or basic level for health literacy (ODPHP, 2008). A person with basic health literacy should be able to read a pamphlet and state two reasons for a person without symptoms to be tested for a disease (ODPHP, 2008).
Parent’s health literacy can be an additional barrier to making informed decisions about their child’s health care. Parents with low health literacy find it more challenging to understand health information as it pertains to their child, and these children often lack preventative healthcare, such as recommended vaccines (Chesser et al., 2012). In a cross-sectional study by Veldwijk et al. (2015), parent’s preferences in regards to their children’s vaccinations was found to be directly associated with the health literacy of the parent. In a study by Balogun et al. (2017), findings suggest that maternal education leads to better literacy skills and better health-seeking behaviors and this improves the receipt of immunizations in their children. Initiatives, which target the health literacy of mothers, could improve vaccination coverage in their children (Johri et al., 2015). In a study by Yin et al. (2009), simplification of the reading level of written information targeted to parents was found to improve both patient and parent understanding. In vulnerable populations, an increase in literacy pertaining to vaccines, will serve to increase vaccination compliance (Amit Aharon, Nehama, Rishpon, & Baron-Epel, 2017).

**Theoretical Framework**

The theoretical model for change to evidence-based practice, which was first identified by Rosswurm and Larrabee in 1999, was used to guide this capstone project through the process of evidence-based change. The Rosswurm and Larrabee model, guides practitioners through the process of developing and integrating evidence-based practice change and is composed of six constructs of change. These six constructs are (a) assess the need for a change in practice, (b) link the problem interventions and outcomes, (c) synthesize the best evidence, (d) design a practice change, (e) implement and evaluate the change in practice, and (f) integrate and maintain the change in practice. This model provides a simple framework for health care practitioners to create and incorporate quantitative and qualitative research.
Methodology

Design

A mixed-methods exploratory design was chosen for this study to determine if a change in process could be quantified by an increase in returned consents, and if the current process was working for the parents. This design provides various means of exploring the identified problem. As soon as a consent is returned to the SBHC, the immunization is administered. Thus, a returned consent was used as a proxy for a completed immunization.

Setting

The study was conducted on students at the SBHC in BPS #89, Dr. Lydia T. Wright School of Excellence on the East side of Buffalo, NY. The school is an elementary school and serves students from pre-kindergarten to eighth grade; ages three through 15 years old. There are currently 667 students enrolled in the school, and 586 (88%) have signed up for SBHC services (NYSDOH, 2017). The racial profile of the school population is 87% Black, 3% White, 8% other, 1% Asian, and <1% American Indian (NYSDOH, 2017). Female students comprise 54% of the population and male students 46% (NYSDOH, 2017). On average, 40-45 students are seen at the SBHC daily (Infinite Campus, 2017). Of the school population, 46 students qualify for a medically fragile classroom, and another 46 students are in special education for learning disabilities (Infinite Campus, 2017). Over 50% of the students in the study reside in four Buffalo zip codes of 14215, 14211, 14214 and 14208. In these zip codes, 27.6% to 36.3% of individuals live below the poverty level and 100% of these students qualify for a free breakfast and lunch program (City-Data, 2017).
Sample

Cases for the quantitative component included all students in grades 6, 7, 8, who were enrolled in the SBHC at BPS #89 on October 18, 2017. This included 157 SBHC enrolled students (86.3%) of the 182 students within these grades in the school. Students found to be lacking one of the ACIP recommended immunizations according to their NYSIIS record were eligible. Students who were lacking only an influenza vaccine were excluded due to the study’s duration and the length of the influenza season. Students who were not lacking at least one ACIP recommended vaccine were not included. Students who had already returned their parent’s consent were “in-process” and were excluded. Students who had written religious or medical exemptions to vaccinations were not included in this study. Forty-six percent of the SBHC students in grades 6, 7, and 8 met the inclusion and exclusion criteria (n=72).

Participants for the qualitative component of the study were a convenience sampling of parents of students from the SBHC at BPS #89. All parents with a child enrolled in the SBHC were eligible to complete the interviews. Parents were not recruited, but were invited to participate if they came into the SBHC or telephoned the clinic for any reason. Parents whose children were not enrolled in the SBHC were excluded from the study. The total number of parents who participated in the interviews was (n=29).

Variables

The independent variables were the two methods of sending out parent vaccine consents, routine practice versus the two-step intervention. For the purposes of this study, the term “parents” was used to define both parents and guardians of the students. Routine practice involves sending a parent consent form (see Appendix A) and a VIS (see Appendix B) for the immunization that the student is lacking home in an envelope via the student. The intervention involved an additional parent letter (see Appendix C) along with the parent consent form and
VIS being sent home in an envelope with the student. Two weeks later, Step-2 of the intervention was a repeat of the first step mailed home to the parent if the first consent had not yet been returned to the SBHC.

Three dependent variables were studied. The first dependent variable determined whether the consent was returned. This variable was a dichotomous variable and was recorded as yes or no on the data collection tools (see Appendices D and E). The second dependent variable determined if the student was fully immunized. This was a dichotomous variable and was recorded as yes or no on the data collection tools. This was determined by whether the student was lacking an age-appropriate ACIP recommended vaccine according to their NYSIIS record. Any age-appropriate vaccine that was not documented in the student’s NYSIIS record would be considered a no for this variable. The third dependent variable determined who immunized the student. This was a categorical variable and was recorded as SBHC, other, or none on the data collection tool. A student who was immunized at the SBHC would be recorded as such, a student immunized at another healthcare provider would be recorded as other and a student who did not receive a vaccine was recorded as none.

Demographic characteristics such as age, gender, grade, types and necessity of vaccines were also recorded on the data collection tool. Vaccines were tabulated once for each type of vaccine, but were not counted more than once if both immunizations in a series were lacking. Thus, a student lacking a hepatitis A (Hep A) vaccine #1, and #2, was counted as lacking a Hep A, and a student lacking only a Hep A #2, was also counted as lacking a Hep A. Vaccine necessity was determined by the NYSDOH immunization requirements for school attendance (NYSDOH, 2016). Required vaccines included students who were lacking a hepatitis B (Hep B), inactivated poliovirus (IPV), measles, mumps, rubella, varicella (MMR/V), or were in sixth
grade and missing a tetanus, diphtheria, acellular pertussis (Tdap), or in seventh grade and missing a meningococcal vaccine. Recommended vaccines included students who were missing a Hep A or HPV vaccine, or were in sixth grade and were lacking a meningococcal vaccine. The vaccine was recorded as both if the student was lacking a required and recommended vaccine.

**Research Procedures**

The University at Buffalo Internal Review Board (UBIRB) determined that this proposal was not human subjects’ research. Infinite Campus was used to check the homeroom lists of the sixth through eighth grade students (Infinite Campus, 2017). All students in grades 6, 7, and 8 at Lydia T. Wright School #89 were screened for eligibility. The students enrolled in the SBHC in October of 2017, underwent a NYSIIS screening and were included if they were lacking at least one ACIP recommended age-appropriate vaccine. Students who were eligible were alternately assigned to the control group and the intervention group. Data collection tools were used to record assigned case ID’s, demographic information such as age, gender, grade, vaccine type, and whether the vaccine was required, recommended or both.

The control group participants were sent both the parent consent form (see Appendix A) and a VIS (see Appendix B) in an envelope home via the student. The intervention group were sent home Step-1 which included the parent letter (see Appendix C), parent consent form, and VIS in an envelope with the student. The parent letter outlined a step-by-step process of signing and returning the consent to the SBHC and was designed to address parent’s health literacy using the Flesch Ease Readability Formula (2017). As vaccine consents were returned to the clinic, they contained participant’s name and date of birth and classroom number. Once the vaccine was administered, the consent was scanned to the patient’s electronic medical record and this became part of the permanent Kaleida medical record, which was current standard practice. Step-2 of the
Intervention was a repeat of the first step mailed to the parent at the student’s home address after two weeks, if no consent had been returned to the SBHC. Step-2 was chosen to provide a multifaceted approach to capture parents who may not be receiving the consent being sent home from school with their child. Infinite Campus was used to determine the student’s home address (Infinite Campus, 2017). Quantitative data collection tools were stored in a locked filing cabinet prior to electronically encrypting and analyzing data through SPSS software.

A structured interview guide was used to conduct parent interviews. Questions focused on the SBHC immunization program. Questions were aimed at determining parental perceptions of the current consent process, their ideas for ways the SBHC could help them keep their child’s immunizations current, why they believed immunizations were important, and the source of their immunization information (see Appendix F). The recommendations of Kallio, Pietila, Johnson, and Kangasniemi (2016) were used to develop the structured interview guide to answer the research question and to establish the guide’s trustworthiness.

Parents who came into or telephoned the SBHC were invited to participate. Parents were asked if they were currently available, or were offered another time if this was not convenient. Rescheduled interviews were offered either by phone or in person. Parents were instructed that their involvement was voluntary and that they may choose to stop the interview at any time. They were reassured that there would be no negative consequences if they chose to stop answering questions. Each interview lasted less than ten minutes. Field notes were taken during the interviews, there were no audio recordings.

Key themes were identified and used to develop a second structured interview guide to explore perceptions from parents whose children were part of the quantitative study (see Appendix G). These second interviews involved two parents from the control group sample and
two parents from the intervention group sample. These interviews followed the same format as the initial interviews, and lasted 10 to 15 minutes each.

**Data Collection.** A NYSIIS screening was conducted initially to determine eligibility in the study. A repeat NYSIIS screening occurred two months after the intervention. Quantitative data was recorded on the data collection tools (see Appendices D and E). The Primary Investigator (PI) entered data from the data collection tool into an Excel spreadsheet.

Qualitative data was collected through brief structured interviews with parents. These interviews included questions to examine the parent’s perceptions on the role of the SBHC, its role in their child’s immunizations, the consent process of the SBHC, their beliefs on their child’s immunizations, and what the clinic could do to assist them with keeping their child up-to-date on their immunizations (see Appendix F). The purpose of the initial interviews was to gain insights on parent’s opinions on the SBHC immunization program. The purpose of the second interviews was to ascertain parent’s beliefs about the SBHC, its services, their preferences on where their child obtained immunizations, and benefits or obstacles to receiving immunizations at the SBHC (see Appendix G). Interviews were not recorded, but field notes were kept, no names were recorded to ensure privacy and confidentiality.

**Ethical Considerations**

The study involved children’s immunization consent process but did not involve children. The IRB at University at Buffalo determined that this was not human subject research. Quantitative data collection tools were de-identified and stored in a locked filing cabinet prior to electronically encrypting and analyzing data through SPSS software. All vaccine consents containing patient’s names were incorporated into the patient’s electronic medical record as soon as the vaccines had been administered.
Qualitative data was obtained from parents only. Verbal consents were obtained from the parents undergoing the structured interviews. Face–to-face and telephone interviews took place in the privacy of the nurse practitioner’s office within the SBHC. Confidentiality and privacy for all parent participants was maintained as per Kaleida policy and Health Insurance Portability and Accountability Act (HIPAA). No compensation was offered to parent participants and parents who were unable to participate at the time were able to reschedule if they desired.

Data Analysis

Quantitative data analysis was conducted using Excel and the Statistical Package for the Social Sciences (SPSS software, version 24). Descriptive statistics include demographic characteristics of age, gender, and grade level and types and necessity of vaccines. These are provided as frequency units and percentages.

Analysis of outcome variables were analyzed by cross tabulations and a chi-square test of independence, using a level of significance set at $p \leq .05$. Three chi-square analyses were performed comparing the control group or the intervention group and the three dependent variables; was the consent returned, was the student fully immunized, and who immunized the student. The data was re-coded as 0 = yes, 1 = no for the was the consent returned, and was the student fully immunized. The data was re-coded as 0 = SBHC, 1 = Other, and 2 = None for the variable who immunized the student. This re-coded data was transferred into an excel spreadsheet prior to inputting into SPSS.

Qualitative data from the initial parent interviews was analyzed according to the process for inductive content analysis as advised by Elo and Kyngas (2008). This process included open coding, creating categories and abstraction (Elo & Kyngas, 2008). For the open coding, notes were taken in the margins of the interview notes. Categories were created as common themes
developed and abstraction included grouping subcategories together into the main themes. After each interview, the PI reread and rewrote field notes for clarification.

A qualitative faculty expert from University at Buffalo compared this data to determine content analysis. Themes that emerged in this data described parent’s feelings in regards to the SBHC immunization program, the consent process, parent’s beliefs about their child immunizations, and their immunization information sources. Following the first interviews it was determined that further exploration of parent’s feelings about the SBHC should also be included. Thus, second interviews were performed to gain more extensive knowledge on parent’s thoughts and feelings regarding the SBHC, childhood immunizations, and the role of the school nurse in their child’s immunizations. These second interviews were analyzed for content analysis and common themes. Examination of the entire data set was performed and initial themes were found to have similarities and were able to be collapsed into one another. Thus, the final thematic map was created with three central themes. Direct quotes from parents are used to support these themes.

Results

Quantitative

Of the 182 students, 157 of them were enrolled in the Kaleida Health School Based Health Center (SBHC). Immunization records for all 157 students were screened through NYSIIS. Of these students, 61 were not lacking an Advisory Committee on Immunization Practices (ACIP) recommended vaccine, and thus not eligible to participate in the study. Another 24 students were “in-process” because signed parental consents were already received by the SBHC. The remaining 72 students were eligible for the study. All eligible students were alternately assigned to the control or intervention groups by use of homeroom class lists. For
example, the first student who was eligible was assigned to the control group; the next student was assigned to the intervention group. Table 1 illustrates the demographic characteristics of the control group, intervention group, and total study participants. Both groups contained a similar number of 11, 13, and 14 year olds, with the control group containing only six 12 year olds (16.7%) as compared to eleven 12 year olds (30.5%) in the intervention group. Females composed the majority of both groups, 23 (63.9%) in the control group and 20 (55.6%) in the intervention group. The two groups were evenly divided amongst the sixth to eighth grades. Thirty-six students were assigned to each group. The students were assigned a case ID and the data collection tools separated the control and intervention groups.

Table 2 depicts the vaccine types and necessity of vaccines that study participants were lacking. A total of 114 vaccines were lacking in the 72 study participants, 59 from the control group and 55 from the intervention group. HPV composed (56.5%) of the lacking vaccines, 34 (57.6%) from the control group and 31 (56.4%) from the intervention group. Meningococcal vaccine was the next most common vaccine found lacking (15.7%), nine vaccines from each group. Hepatitis A was third (14.7%), with 10 vaccines lacking from the control group and seven from the intervention group. Recommended vaccines were responsible for (66.7%) of lacking vaccines, 24 from each group. This is largely due to the number of HPV vaccines that were lacking in both study groups.

Cross tabulations were used to examine the relationships between the control group and the intervention groups and the three dependent variables. Chi-square was used to test these relationships for significance. The level of significance was set at $p < .05$. For the dependent variable, was the consent returned, the 72 study participants (36 in each group) were arrayed in a 2 X 2 contingency table. There was a higher rate of returned consents for the intervention group
(33.3%), than in the control group (11.1%). Table 3 shows the chi-square test of independence, which demonstrates a significant relationship between the two groups \((\chi^2 [1, n=72] = 5.143, p = .023)\). Thus, the observed group difference in the number of returned consents was due to the two-step intervention and not to random sampling fluctuations.

For the dependent variable, was the student fully immunized, the 72 study participants (36 in each group) were arrayed in a 2 X 2 contingency table. This demonstrated that there was a higher number of students fully immunized in the intervention group (36.1%), than in the control group (25%). Table 3 shows the chi-square test of independence, which demonstrates that there was not a significant relationship between the two groups. Thus, the observed group difference in the number of fully immunized students was not due to the two-step intervention and was due to random sampling fluctuations.

For the dependent variable who immunized the student, the 72 study participants (36 in each group) were arrayed in a 2 X 3 contingency table, which demonstrated that there was a higher number of students not immunized at all in the control group (66.7%), then in the intervention group (55.6%). There was a higher number of students immunized by another provider other than the SBHC for the control group (22.2%) as compared to that of the intervention group (19.4%). The number of students immunized at the SBHC was higher in the intervention group (25%) as compared to the control group (11.1%). Table 3 shows the chi-square test of independence, which demonstrates that there was not a significant relationship between the two groups. Thus, the observed group difference in the number of fully immunized students was not due to the two-step intervention and was due to random sampling fluctuations.
Qualitative

Structured qualitative interviews were conducted with parents, and focused on the SBHC’s immunization program. The SBHC process of sending out and obtaining parent consents for immunizations was explored. In addition, it was important to obtain parent’s opinions on the SBHC’s role in providing immunizations, their perspectives on the importance of immunizations for their child, and where they obtained immunization information (see Appendix F). In order to get a broad perspective, brief structured interviews were conducted. A total of 25 parents who had students enrolled in the SBHC, but may or may not have been study participants were interviewed first. This diverse sample, n=25, included mothers (n=13), fathers (n=6), and legal guardians (n=7). Of the legal guardians, there were three aunts, two grandfathers, and one grandmother. The sample included caregivers of children new to the SBHC as well as parents of students who had long relationships at the SBHC. Nineteen of the interviews were face-to-face and six interviews were by telephone. All interviews took place in the privacy of the nurse practitioner’s office of the SBHC. Each interview lasted less than ten minutes.

These interviews and field notes were read and re-read until a coding guide with common themes was developed. Each question was analyzed for content, main ideas were formulated, and then commonalities in patterns evolved. Once a theme was identified, interviews were again reassessed as to whether more responses could be applied to this theme. These themes were iteratively revised and refined for content analysis. The initial 25 interviews were analyzed and key themes were determined. These themes centered around (a) SBHC role in immunizations, (b) SBHC consent process, (c) purpose of immunizations, and (d) sources of immunization information.
Following this data analysis and consultation with a qualitative research expert at the University at Buffalo, greater exploration of parent’s perceptions was deemed necessary. Thus, second interviews focused on parent’s thoughts and opinions about the SBHC’s purpose. Parents were asked about their views on the services provided by the SBHC. The benefits and barriers to receiving immunizations at the SBHC was also explored (see Appendix G). These interviews targeted parents of children directly involved in the study, one mother and one father from the control group, and one stepmother and one grandmother from the intervention group. Two of these interviews were face-to-face and two were by telephone. These interviews lasted 10-15 minutes, and took place in the nurse practitioner’s office of the SBHC.

These second interviews were then analyzed by using an inductive content analysis approach to make sense of the data. As common themes materialized, these interviews were re-analyzed to incorporate more thoughts and opinions into these themes. Three distinct themes emerged from the analysis of data obtained after these second interviews included (a) purposes of a SBHC, (b) advantages of a SBHC, and (c) the school nurse’s role in immunizations. After careful consideration, it was determined that all of the data from both sets of interviews could be classified into three themes. The three themes were (a) parent’s perceptions of the SBHC, (b) parent’s perceptions of immunizations, and (c) parent’s perception of the SBHC’s role in immunizations.

**Parent’s perception of the SBHC.** The first theme included the purpose of a SBHC, the role of the school nurse and advantages of SBHC. All of the parents interviewed were able to identify a purpose of the SBHC, and parents who had older children were able to mention several services that the clinic provides. Quotation exemplars are provided in italics.

*I feel that the school clinic provides care for everything that a doctor’s office can.*
The school nurse’s role was also clearly understood by parents and in many instances parents discussed the school nurse’s primary role as keeping parents informed of what injuries or illnesses their child may have encountered during the school day. Many parents were able to state what they felt were the advantages of a SBHC, and it was clear that the parents appreciated having these services available to their children.

*I like the fact that I can always call or send in a note and my child can be seen while at school, and I don’t have to take off work.*

**Parent’s perceptions of immunizations.** The second theme was comprised of parent’s understanding of the purpose of immunizations, the source of this information, and their understanding of the information they have received concerning immunizations. All of the parents interviewed were supportive of immunizations and not one parent expressed any vaccine hesitancy. Parents endorsed their child’s need for immunizations to both protect their child and for public safety.

*I feel that I have always understood the risks of not getting shots could be great.*

They cited their doctor or their child’s pediatrician most frequently as their source of information, but also credited the SBHC, their own parents, on-line resources, and their health-care employment as information sources.

*I have received my knowledge over the years of raising five children, mostly from doctors, and reading newspapers.*

Parents stated their understanding of the information they received, and felt their questions were adequately answered.

*I feel like my information from my children’s doctors was well explained to me.*
Parent’s perceptions of the SBHC’s role in immunizations. The third theme contained subthemes of parent’s perceptions of the SBHC’s purpose as far as immunizations, the school nurse’s role in immunizations, and the SBHC’s consent process. Parent responses varied as to the purpose of the SBHC’s role in their child’s immunizations. Several responses centered on monitoring immunization compliance for the school.

If my child needs immunization updates then I think it is the school clinic’s duty to inform me.

Many, but not all, were aware that immunizations were provided at school. A few parents disagreed with immunizations at school.

I don’t think the school clinic should provide immunizations.

Some preferred taking their child to the doctors for immunizations, but recognized that other parents might be unable to do so and thus, would benefit from the availability of immunizations at school. Parents recognized the role of the school nurse role as primarily informing parents and record keeping.

I think the school nurse can notify parents of what shots are due for next year.

The majority of parents preferred the current practice of sending consents home with the students.

I think the way it is done now by sending the consent home with the student is the best way.

Many parents had other suggestions that included phone calls, mailing, text messages, parent portal, and class Dojo. Parent portal is an on-line parent information system that parents use to monitor their child’s grades, assignments, and attendance (Buffalo Public Schools, 2018). Class Dojo is a classroom management tool available as a computer or mobile app that allows teachers
to share classroom information or privately message parents (Apple Incorporated, 2018). Additional direct quotes from parent interviews support these findings (see Table 4).

Discussion

The purpose of the quantitative component of this study was to determine if implementation of the two-step intervention would increase the number of returned parent immunization consents in a SBHC. In this study, a significant relationship was found in the rate of returned consents for the intervention group (33.3%), as compared to the control group (11.1%). As compared to the findings of Eldred et al., (2015) where only 10.9% of students returned consents, the returned consent rate for this study was a substantial improvement.

However, 11 of the 12 returned consents in the intervention group followed Step-1 of the intervention and only one additional consent was returned following the Step-2 mailing. While this demonstrates the success of the parent letter, it does not support the feasibility, additional nursing time, and costs associated with mailing of consents. Perhaps, a second attempt in sending home with the student would be more practical. The impact of the concise and lower readability index of the revised parent letter on the increased rate of returned consent forms further illustrates the importance of simplifying the consent in increasing parent understanding. Yin et al. (2009) suggests that interventions that address parental health literacy will make improvements in child health disparities. Blogen et al. (2017) found that a child’s immunization uptake could best be explained by a mother’s literacy skills. Studies that target health literacy can make improvements in vaccine uptake (Johri et al., 2015).

No significant relationships were shown with the other two dependent variables. For the variable, “was the student fully immunized?” this may be related to students not receiving all of the ACIP recommended vaccines when immunized at a medical provider other than the SBHC.
Six of the 15 students (40%) who received immunizations outside of the SBHC, still lacked one or more of the age-appropriate ACIP recommended vaccines. Whereas, all 13 students (100%) who received immunizations at the SBHC were fully immunized for their age according to the ACIP recommendations. The CDC recommends not missing an opportunity to vaccinate an eligible person at every healthcare encounter (CDC, 2015). Missed opportunities may occur for many reasons, such as providers avoiding simultaneous vaccine administration, or providers lacking the knowledge of vaccination scheduling (CDC, 2015).

For the variable, “who immunized the student?” the results may have been skewed by the high percentage of students who were not immunized. Sixty one percent of the study participants, 44 out of 72, remained under-immunized at the end of the study period. Given these rates, further studies to improve vaccination rates amongst schoolchildren are needed.

The purpose of the qualitative component of this study was to ascertain parent’s perceptions on SBHC immunization practices. The key themes provided insight to parent perceptions on the SBHC, on immunizations, and on the SBHC’s role in immunizations. Most parents expressed favorably what they felt were the advantages of having a SBHC for their child. Parents were able to communicate most, if not all of the services available to them and their child. The interviews gave parents a voice to make suggestions and express ways of improvements, while also allowing them to express ways that the SBHC was meeting their family’s needs. Overall parent satisfaction with SBHC services was high. Parents recognized the myriad ways the nurse practitioner provides care for the students. Parents consider school nurses as one of their most valuable resources for health information (National Association of School Nurses, 2015).
Parents held overwhelming positive perceptions on immunizations. They felt knowledgeable about their information and were able to recognize where they could obtain more information if needed. Parents were comfortable with the information provided for them by their doctors and other healthcare professionals. Despite increasing numbers of parents who have become wary of vaccines in the US, the structured interviews did not reveal any vaccine hesitancy within this study. This is different from the over 30% of parents who report having refused or delayed HPV for their daughters (Dorell et al., 2011).

Parents were able to express their knowledge, satisfaction, and make suggestions to the SBHC’s immunization efforts. They acknowledged and appreciated the efforts of the school nurse in maintaining compliance with the school’s immunization regulations. This study may be the first one that has attempted to gain insight into parental preferences in regards to the consent process for SBHC immunizations, so these findings may be novel. The majority of parents preferred the immunization consents sent home with their child. Parents also suggested the use of technological communication such as phone calls, text messages, and emails to receive and return the vaccine consent. Class dojo and use of the parent portal on-line information system could also be explored in future studies.

Dissemination of these results includes a white paper presented to the program director and nursing manager of the Kaleida SBHC program. This white paper includes a brief description of the study’s results in an effort to improve the methods of communicating with parents regarding immunizations and consents. Further dissemination of this information should also focus on other school nurse practitioners and school nurses in the Kaleida school health program.
Application of Theoretical Framework

Rosswurm and Larrabee’s theoretical model (1999) acted as a guide for the process of evidence-based change. These six constructs were incorporated throughout the study and guided this study through this systematic process of quality improvement.

Assess the need for a change in practice. A needs assessment demonstrated that 50 to 72.7% students in grades 6 through 8 were lacking one or more of the ACIP recommended immunizations. Comparison of these rates to the Healthy People 2020 benchmark of 80% demonstrated the need for change (ODPHP, 2017). The problem was related to obtaining parent consents. The return of parent’s vaccination consents was between 10-15% with the current practice of sending consents home with the students. Thus, a change in practice was needed to improve patient outcomes.

Link the problem interventions and outcomes. The second construct of the Rosswurm and Larrabee model is linking the problem with the intervention, and its outcomes. The current consent form was evaluated and the readability of the form was rated at a grade 12 reading level (Flesch Ease Readability Formula, 2017). Utilizing the recommendations of the AHRQ of the USDHHS of gearing health information at a grade 5 level, a parent letter was devised with a readability level of grade 5 (USDHHS, AHRQ, 2016; Flesch Ease Readability Formula, 2017). Thus, this parent letter was included in the two-step intervention as a method for improving the vaccine compliance in the SBHC.

Synthesize the best evidence. A literature review sought to determine interventions found effective in improving vaccination rates in SBHC. In addition to consideration of parent’s literacy levels, use of reminders have demonstrated an increase in the number of returned consents forms (Cawley et al., 2010). Using a two-step intervention which incorporated both
Design a change in practice. The change in practice was designed to improve patient outcomes in the SBHC at BPS #89. Based on the literature, a two-step intervention was developed. This incorporated parent’s literacy levels and use of a mailed reminder to provide a multi-faceted approach to capture parents whose children may be failing to bring the consent home to their parent. Efforts to address consent procedures in SBHC must target literacy barriers faced by minority parents to increase vaccine uptake (Batista Ferrer et al., 2015).

Implement and evaluate the change in practice. The study began with the implementation of the two-step intervention at SBHC at BPS #89. This two-step intervention was compared to routine practice. It was piloted on sixth to eighth grade students who were lacking ACIP recommended vaccines for their age. This created a practice change that could be implemented, measured, and evaluated for its effectiveness in improving patient outcomes.

Integrate and maintain the change in practice. The final step of the Rosswrum and Larrabee theoretical framework is to integrate and maintain the practice change. Results of the study were evaluated, and adding the parent letter to the system-wide consent form was found an effective way of increasing returned consents to the SBHC. Thus, dissemination of these findings will be shared via a white paper to the Kaleida Health organization.

Strengths

The strength of this study was its design. A mixed-methods design was the appropriate methodology to examine a quantifiable method for increasing returned consents in the SBHC, and to add depth and further understanding of parent’s perspectives on the SBHC role in their
child’s immunizations. The study can be replicated in other SBHC due to the detailed data collection procedures that have been outlined. Utilization of the immunization information system allowed this research to obtain a complete data collection with no missing data. This provided an ideal dataset for examination and analysis. This not only simplified the analysis but also maintained the precision of the established confidence interval (Soley-Bori, 2013).

The strength of the parent interviews is its contribution to the existing literature. The findings on parent’s perceptions on the SBHC’s role in immunizations provide an important first step in addressing improved methods of communicating with parents to obtain vaccine consents in SBHC. The design of these structured interviews increased reliability because each question received a response. Thus, there was no missing data. The PI was the interviewer and in order to maintain objectivity and limit bias a second researcher was used to increase neutrality, consistency and credibility of the qualitative data analysis.

**Limitations**

The study was unable to demonstrate a significant relationship on the number of students who were fully immunized during the study’s duration. Thus, limiting the power and generalizability of the results. Sources of potential bias and threats to internal validity may have included the study’s duration. A two-month period elapsed from initial screening to the final screening of NYSIIS records, during which students may have been due for a well child check and immunization updates that were not a result of this study. The study sample was drawn from only one setting, which may limit the generalizability to even other Buffalo SBHCs, due to the specific demographics of each SBHC. Threats to external validity may have occurred due to the racial homogeneity of the sample. The racial profile of the school population was 87% Black. That may have created biases that would not exist in a more diverse population.
The interviews were limited by the time constraints of the parents who were in the SBHC primarily for reasons other than the interview. Parents were offered another more convenient time for the interview, but no parents returned phone calls or came into the SBHC at a different time for an interview. Another limitation may be due to the convenience sampling of parent interviews, responses may not reflect those who were not interviewed. Researcher bias may have resulted due to the personal biases of the one interviewer who was well established in the SBHC.

Implications for Practice

The Healthy People 2020 goals can be achieved with interprofessional collaboration. APNs are able to provide the leadership to advocate for the improvement of evidence-based patient outcomes. In populations that include racial and economic disparities this is especially true. The structured interviews identified how much credibility parent responses held for the information given to them by trusted resources. In SBHC, APN’s play a daily role in providing health education to students, parents, and school staff. It is imperative that as APNs we develop and evaluate various quality improvements that meet the current and future needs of our patients. Immunizations provide an opportunity to advocate for our patients by addressing effective methods to reduce and eliminate these health disparities.

Conclusion

Recommended vaccines can prevent the spread of infections, decrease risk of mortality and even prevent cancer. SBHCS have the capability of providing these immunizations for all of the students in their care. Parents have empowered school nurses by recognizing them as reliable sources of health information. As nurses, we must strive to find effective strategies to increase recommended vaccination rates and most importantly prevent illnesses, infections, and cancers. This study provides insights into how an improved SBHC immunization process can increase
return of consent rate and provide more vaccinations for SBHC students. It also offers a unique awareness of the thoughts, feelings, and opinions of parents in regards to immunizations in the SBHC. In summary, our ability to collaborate with our student’s parents will help to bridge the gap towards the Healthy People 2020 goals.
References


Table 1

*Demographic Characteristics of Study Groups*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Group</th>
<th>Intervention Group</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Age</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>14</td>
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</tr>
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<td>6</td>
<td>16.7</td>
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<td>38.9</td>
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</tr>
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<td>20</td>
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<tr>
<td>Grade</td>
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<td>33.3</td>
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<td>11</td>
</tr>
<tr>
<td>8</td>
<td>14</td>
<td>38.9</td>
<td>14</td>
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</table>

*Note.* N=72. Control group n=36, intervention group n=36.
### Table 2

**Types and Necessity of Vaccines**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Group</th>
<th></th>
<th>Intervention Group</th>
<th></th>
<th>Total</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>N</td>
<td>%</td>
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<td>14.7</td>
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<td>1</td>
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<td>56.5</td>
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<td>1</td>
<td>.9</td>
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<td>5.1</td>
<td>4</td>
<td>5.4</td>
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<td>6.1</td>
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<td>3</td>
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<td>24</td>
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<td>Required</td>
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<td>8.3</td>
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<td>5.6</td>
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<td>30.6</td>
<td>9</td>
<td>25</td>
<td>20</td>
<td>27.8</td>
</tr>
</tbody>
</table>

*Note. N=72. Control group n=36, intervention group n=36. HPV = Human Papillomavirus; IPV = inactivated poliovirus; MMR/V = Measles, Mumps, Rubella, and Varicella; Tdap = Tetanus, Diphtheria, and Pertussis.*

### Table 3

**Chi-square Test of Independence for Dependent Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\chi^2$</th>
<th>df</th>
<th>Asymptomatic Significance (2 sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was Consent Returned?</td>
<td>5.143$^a$</td>
<td>1</td>
<td>.023</td>
</tr>
<tr>
<td>Was Student Fully Immunized?</td>
<td>1.047$^b$</td>
<td>1</td>
<td>.306</td>
</tr>
<tr>
<td>Who Immunized the Student?</td>
<td>2.353$^c$</td>
<td>2</td>
<td>.308</td>
</tr>
</tbody>
</table>

*Note. N=72. Significance level set at $p<.05$.*

$^a$0 cells (.0%) have expected count less than 5. The minimum expected count is 8.00.

$^b$0 cells (.0%) have expected count less than 5. The minimum expected count is 11.00.

$^c$0 cells (.0%) have expected count less than 5. The minimum expected count is 6.50.
### Table 4

**Parent’s Perceptions with Supporting Quotes**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Parent’s Perceptions of SBHC</th>
<th>Parent’s Perceptions of Immunizations</th>
<th>Parent’s Perceptions of SBHC Role in Immunizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Purpose</td>
<td>“to take care of students’ medical needs during the school day”</td>
<td>“to keep kids healthy”</td>
<td>“to inform me of shots that are needed and then I have a choice to take her to her doctor’s or have them done at school”</td>
</tr>
<tr>
<td></td>
<td>“to provide medical care for minor medical illnesses so that my child can stay at school and I can stay at work”</td>
<td>“to protect people in case of a disaster”</td>
<td>“to be sure that students who are missing vaccines are monitored until they are caught up”</td>
</tr>
<tr>
<td></td>
<td>“to do physicals”</td>
<td>“they keep my child as healthy as possible”</td>
<td>“to educate parents”</td>
</tr>
<tr>
<td>Role of School Nurse</td>
<td>“to give daily medications”</td>
<td>Sources of Information “I have received most of my information from my children’s doctor”</td>
<td>Role of School Nurse “Keep parents informed”</td>
</tr>
<tr>
<td></td>
<td>“to provide first aid for injuries”</td>
<td>“from my parents”</td>
<td>“to make sure my child and the other children have all of their shots”</td>
</tr>
<tr>
<td></td>
<td>“she’s always there to answer parents questions”</td>
<td>“from the school clinic and my pediatrician mostly”</td>
<td>“source of information for other schools”</td>
</tr>
<tr>
<td></td>
<td>“to inform me if my child gets sick or injured”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advantages of SBHC</td>
<td>&quot;convenient&quot;</td>
<td>Understanding of Information “I feel that the shots were always explained to me in a way that I could understand”</td>
<td>Consent Process “I like the way the school nurse sends the papers home with my child”</td>
</tr>
<tr>
<td></td>
<td>“way easier than taking to doctors”</td>
<td></td>
<td>“phone call or text would work for me”</td>
</tr>
<tr>
<td></td>
<td>“it’s very helpful because I don’t have insurance”</td>
<td></td>
<td>“the school’s parent portal or class Dojo”</td>
</tr>
</tbody>
</table>
Appendix A

Kaleida Vaccine Consent for Routine Practice Control Group

I have been provided a copy of the appropriate Vaccine Information Statement(s) (VIS) and have read, or have had explained to me, information about the diseases and the vaccines listed below. I have had the chance to ask questions that were answered to my satisfaction. I believe I understand the benefits and risks of the vaccines cited, and ask that the vaccine(s) listed below to be given to me or the person named above (for whom I am authorized to make this request).

If the immunization is being refused, have parent/guardian place their initials after immunization name. Record this refusal in Powerchart.

Parent/Guardian Signature

Parent/Guardian Print Name

Witness Signature

Witness Print Name

Immunization administration documentation should be charted electronically in Powerchart. This signature record should be scanned into the electronic medical record.
Appendix B

Example of VIS sheet

Vaccine Information Statement

Meningococcal ACWY Vaccines—MenACWY and MPSV4: What You Need to Know

Many Vaccine Information Statements are available in Spanish and other languages. See www.immunize.org/vis.


1. Why get vaccinated?
Meningococcal disease is a serious illness caused by a type of bacteria called Neisseria meningitidis. It can lead to meningitis (infection of the lining of the brain and spinal cord) and infections of the blood. Meningococcal disease often occurs without warning – even among people who are otherwise healthy.

Meningococcal disease can spread from person to person through close contact (coughing or kissing) or lengthy contact, especially among people living in the same household.

There are at least 12 types of N. meningitidis, called “serogroups.” Serogroups A, B, C, W, and Y cause most meningococcal disease.

Anyone can get meningococcal disease but certain people are at increased risk, including:
- Infants younger than one year old
- Adolescents and young adults 16 through 23 years old
- People with certain medical conditions that affect the immune system
- Microbiologists who routinely work with isolates of N. meningitidis
- People at risk because of an outbreak in their community

Even when it is treated, meningococcal disease kills 10 to 15 infected people out of 100. And of those who survive, about 10 to 20 out of every 100 will suffer disabilities such as hearing loss, brain damage, kidney damage, amputations, nervous system problems, or severe scars from skin grafts.

Meningococcal ACWY vaccines can help prevent meningococcal disease caused by serogroups A, C, W, and Y. A different meningococcal vaccine is available to help protect against serogroup B.

2. Meningococcal ACWY Vaccines
There are two kinds of meningococcal vaccines licensed by the Food and Drug Administration (FDA) for protection against serogroups A, C, W, and Y: meningococcal conjugate vaccine (MenACWY) and meningococcal polysaccharide vaccine (MPSV4).

Two doses of MenACWY are routinely recommended for adolescents 11 through 18 years old: the first dose at 11 or 12 years old, with a booster dose at age 16. Some adolescents, including those with HIV, should get additional doses. Ask your health care provider for more information.

In addition to routine vaccination for adolescents, MenACWY vaccine is also recommended for certain groups of people:
- People at risk because of a serogroup A, C, W, or Y meningococcal disease outbreak
Appendix B Continued

Example of VIS sheet

- Anyone whose spleen is damaged or has been removed
- Anyone with a rare immune system condition called “persistent complement component deficiency”
- Anyone taking a drug called eculizumab (also called Soliris®)
- Microbiologists who routinely work with isolates of *N. meningitidis*
- Anyone traveling to, or living in, a part of the world where meningococcal disease is common, such as parts of Africa
- College freshmen living in dormitories
- U.S. military recruits

Children between 2 and 23 months old, and people with certain medical conditions need multiple doses for adequate protection. Ask your health care provider about the number and timing of doses, and the need for booster doses.

**MenACWY** is the preferred vaccine for people in these groups who are 2 months through 55 years old, have received MenACWY previously, or anticipate requiring multiple doses.

**MPSV4** is recommended for adults older than 55 who anticipate requiring only a single dose (travelers, or during community outbreaks).

3. Some people should not get this vaccine

Tell the person who is giving you the vaccine:

- **If you have any severe, life-threatening allergies.**
  If you have ever had a life-threatening allergic reaction after a previous dose of meningococcal ACWY vaccine, or if you have a severe allergy to any part of this vaccine, or should not get this vaccine. Your provider can tell you about the vaccine’s ingredients.

- **If you are pregnant or breastfeeding.**
  There is not very much information about the potential risks of this vaccine for a pregnant woman or breastfeeding mother. It should be used during pregnancy only if clearly needed.

If you have a mild illness, such as a cold, you can probably get the vaccine today. If you are moderately or severely ill, you should probably wait until you recover. Your doctor can advise you.

4. Risks of a vaccine reaction

With any medicine, including vaccines, there is a chance of side effects. These are usually mild and go away on their own within a few days, but serious reactions are also possible.

*As many as half of the people who get meningococcal ACWY vaccine have mild problems following vaccination, such as redness or soreness where the shot was given. If these problems occur, they usually last for 1 or 2 days. They are more common after MenACWY than after MPSV4.*

A small percentage of people who receive the vaccine develop a mild fever.

*Problems that could happen after any injected vaccine:*

- People sometimes faint after a medical procedure, including vaccination. Sitting or lying down for about 15 minutes can help prevent fainting, and injuries caused by a fall. Tell your doctor if you feel dizzy, or have vision changes or ringing in the ears.

- Some people get severe pain in the shoulder and have difficulty moving the arm where a shot was given. This happens very rarely.
Appendix B Continued

Example of VIS sheet

- Any medication can cause a severe allergic reaction. Such reactions from a vaccine are very rare, estimated at about 1 in a million doses, and would happen within a few minutes to a few hours after the vaccination.

As with any medicine, there is a very remote chance of a vaccine causing a serious injury or death.

The safety of vaccines is always being monitored. For more information, visit: www.cdc.gov/vaccinesafety/

5. What if there is a serious reaction?

What should I look for?
- Look for anything that concerns you, such as signs of a severe allergic reaction, very high fever, or unusual behavior.
  Signs of a severe allergic reaction can include hives, swelling of the face and throat, difficulty breathing, a fast heartbeat, dizziness, and weakness – usually within a few minutes to a few hours after the vaccination.

What should I do?
- If you think it is a severe allergic reaction or other emergency that can’t wait, call 9-1-1 and get to the nearest hospital. Otherwise, call your doctor.
- Afterward, the reaction should be reported to the “Vaccine Adverse Event Reporting System” (VAERS). Your doctor should file this report, or you can do it yourself through the VAERS web site at www.vaers.hhs.gov, or by calling 1-800-822-7967.
VAERS does not give medical advice.

6. The National Vaccine Injury Compensation Program
The National Vaccine Injury Compensation Program (VICP) is a federal program that was created to compensate people who may have been injured by certain vaccines.

Persons who believe they may have been injured by a vaccine can learn about the program and about filing a claim by calling 1-800-338-2382 or visiting the VICP website at www.hrsa.gov/vaccinecompensation. There is a time limit to file a claim for compensation.

7. How can I learn more?
- Ask your health care provider. He or she can give you the vaccine package insert or suggest other sources of information.
- Call your local or state health department.
- Contact the Centers for Disease Control and Prevention (CDC):
  - Call 1-800-232-4636 (1-800-CDC-INFO) or
  - Visit CDC’s website at www.cdc.gov/vaccines
Vaccine Information Statement
Meningococcal ACWY Vaccines
03-31-2016
42 U.S.C. § 300aa-26
Department of Health and Human Services
Centers for Disease Control and Prevention
Office Use Only
Appendix C

Letter to Parents for Intervention Group

Dear Parent of __________________:

After looking at your child’s records, we have found your child to be missing the immunizations checked on the next page.

Please:
1. CHECK the box below:
   - YES, please give my child the immunizations checked on the next page.
   - NO, I prefer to have my child receive the immunizations at his/her doctor.
2. SIGN the consent on next page.
3. RETURN the consent to the school clinic.

Thank you,

Nurse Practitioner Patty

*Any questions??? Please call 897-8056
Appendix C Continued

Kaleida Vaccine Consent for Routine Practice Control Group

I have been provided a copy of the appropriate Vaccine Information Statement(s) (VIS) and have read, or have had explained to me, information about the diseases and the vaccines listed below. I have had the chance to ask questions that were answered to my satisfaction. I believe I understand the benefits and risks of the vaccines cited, and ask that the vaccine(s) listed below be given to me or the person named above (for whom I am authorized to make this request).

VACCINES:
- DtaP
- DtaP-IPV (Kapture)
- DtaP-IPV-Hib (Pediarix)
- DtaP-IPV-Hib (Pentacel)
- Hepatitis A
- Hepatitis B
- Hib
- HPV/HPV9
- Influenza – Inactivated
- Measles/Mumps/Rubella (MMR)
- Measles/Mumps/Rubella & Varicella (MMRV)
- Meningococcal B
- Meningococcal [MCV4] (Menactra)
- MMR
- Pneumococcal Conjugate PCV13 (Preven)
- Pneumococcal Polysaccharide PPV23 (Pneumovax)
- Polio
- Rotavirus
- Tdap
- Varicella
- Water

Parent/Guardian Signature

Date Time

Witness Signature

Date Time

Immunization administration documentation should be charted electronically in Powerchart. This signature record should be scanned into the electronic medical record.
Example of VIS sheet

Vaccine Information Statement

Meningococcal ACWY Vaccines—MenACWY and MPSV4: What You Need to Know

Many Vaccine Information Statements are available in Spanish and other languages. See www.immunize.org/vis.


1. Why get vaccinated?
Meningococcal disease is a serious illness caused by a type of bacteria called *Neisseria meningitidis*. It can lead to meningitis (infection of the lining of the brain and spinal cord) and infections of the blood. Meningococcal disease often occurs without warning – even among people who are otherwise healthy.

Meningococcal disease can spread from person to person through close contact (coughing or kissing) or lengthy contact, especially among people living in the same household.

There are at least 12 types of *N. meningitidis*, called “serogroups.” Serogroups A, B, C, W, and Y cause most meningococcal disease.

Anyone can get meningococcal disease but certain people are at increased risk, including:
- Infants younger than one year old
- Adolescents and young adults 16 through 23 years old
- People with certain medical conditions that affect the immune system
- Microbiologists who routinely work with isolates of *N. meningitidis*
- People at risk because of an outbreak in their community

Even when it is treated, meningococcal disease kills 10 to 15 infected people out of 100. And of those who survive, about 10 to 20 out of every 100 will suffer disabilities such as hearing loss, brain damage, kidney damage, amputations, nervous system problems, or severe scars from skin grafts.

Meningococcal ACWY vaccines can help prevent meningococcal disease caused by serogroups A, C, W, and Y. A different meningococcal vaccine is available to help protect against serogroup B.

2. Meningococcal ACWY Vaccines

There are two kinds of meningococcal vaccines licensed by the Food and Drug Administration (FDA) for protection against serogroups A, C, W, and Y: meningococcal conjugate vaccine (MenACWY) and meningococcal polysaccharide vaccine (MPSV4).

Two doses of MenACWY are routinely recommended for adolescents 11 through 18 years old: the first dose at 11 or 12 years old, with a booster dose at age 16. Some adolescents, including those with HIV, should get additional doses. Ask your health care provider for more information.

In addition to routine vaccination for adolescents, MenACWY vaccine is also recommended for certain groups of people:
- People at risk because of a serogroup A, C, W, or Y meningococcal disease outbreak


Appendix C Continued

Example of VIS sheet

- Anyone whose spleen is damaged or has been removed
- Anyone with a rare immune system condition called “persistent complement component deficiency”
- Anyone taking a drug called eculizumab (also called Soliris®)
- Microbiologists who routinely work with isolates of *N. meningitidis*
- Anyone traveling to, or living in, a part of the world where meningococcal disease is common, such as parts of Africa
- College freshmen living in dormitories
- U.S. military recruits

Children between 2 and 23 months old, and people with certain medical conditions need multiple doses for adequate protection. Ask your health care provider about the number and timing of doses, and the need for booster doses.

**MenACWY** is the preferred vaccine for people in these groups who are 2 months through 55 years old, have received MenACWY previously, or anticipate requiring multiple doses.

**MPSV4** is recommended for adults older than 55 who anticipate requiring only a single dose (travelers, or during community outbreaks).

3. Some people should not get this vaccine

Tell the person who is giving you the vaccine:

- **If you have any severe, life-threatening allergies.**
  If you have ever had a life-threatening allergic reaction after a previous dose of meningococcal ACWY vaccine, or if you have a severe allergy to any part of this vaccine, or should not get this vaccine. Your provider can tell you about the vaccine’s ingredients.

- **If you are pregnant or breastfeeding.**
  There is not very much information about the potential risks of this vaccine for a pregnant woman or breastfeeding mother. It should be used during pregnancy only if clearly needed. If you have a mild illness, such as a cold, you can probably get the vaccine today. If you are moderately or severely ill, you should probably wait until you recover. Your doctor can advise you.

4. Risks of a vaccine reaction

With any medicine, including vaccines, there is a chance of side effects. These are usually mild and go away on their own within a few days, but serious reactions are also possible.

*As many as half of the people who get meningococcal ACWY vaccine have mild problems following vaccination, such as redness or soreness where the shot was given. If these problems occur, they usually last for 1 or 2 days. They are more common after MenACWY than after MPSV4.*

A small percentage of people who receive the vaccine develop a mild fever.

**Problems that could happen after any injected vaccine:**

- People sometimes faint after a medical procedure, including vaccination. Sitting or lying down for about 15 minutes can help prevent fainting, and injuries caused by a fall. Tell your doctor if you feel dizzy, or have vision changes or ringing in the ears.
- Some people get severe pain in the shoulder and have difficulty moving the arm where a shot was given. This happens very rarely.
Appendix C Continued

Example of VIS sheet

- Any medication can cause a severe allergic reaction. Such reactions from a vaccine are very rare, estimated at about 1 in a million doses, and would happen within a few minutes to a few hours after the vaccination.

As with any medicine, there is a very remote chance of a vaccine causing a serious injury or death.

The safety of vaccines is always being monitored. For more information, visit: www.cdc.gov/vaccinesafety/

5. What if there is a serious reaction?

What should I look for?

- Look for anything that concerns you, such as signs of a severe allergic reaction, very high fever, or unusual behavior.
  
  Signs of a severe allergic reaction can include hives, swelling of the face and throat, difficulty breathing, a fast heartbeat, dizziness, and weakness – usually within a few minutes to a few hours after the vaccination.

What should I do?

- If you think it is a severe allergic reaction or other emergency that can’t wait, call 9-1-1 and get to the nearest hospital. Otherwise, call your doctor.
- Afterward, the reaction should be reported to the “Vaccine Adverse Event Reporting System” (VAERS). Your doctor should file this report, or you can do it yourself through the VAERS website at www.vaers.hhs.gov, or by calling 1-800-822-7967.

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Persons who believe they may have been injured by a vaccine can learn about the program and about filing a claim by calling 1-800-338-2382 or visiting the VICP website at www.hrsa.gov/vaccinecompensation. There is a time limit to file a claim for compensation.

7. How can I learn more?

- Ask your health care provider. He or she can give you the vaccine package insert or suggest other sources of information.
- Call your local or state health department.
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  - Call 1-800-232-4636 (1-800-CDC-INFO) or
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Vaccine Information Statement

Meningococcal ACWY Vaccines

03-31-2016

42 U.S.C. § 300aa-26

Department of Health and Human Services

Centers for Disease Control and Prevention

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In Appendix D, the Data Collection Tool for Control Group is presented. The table includes columns for Case ID, Age, Gender (M=Male, F=Female), Grade, Vaccine Type (R=Recommended, Q=Required, B=Both), Consent Returned, Fully Immunized, and by whom (S=SBHC, O=Other). Here is an example row:

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<th>Case ID</th>
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<th>Gender</th>
<th>Grade</th>
<th>Vaccine Type</th>
<th>Recommended</th>
<th>Consent Returned</th>
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### Appendix E

Data Collection Tool for Intervention Group

<table>
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<th>Case ID</th>
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<th>F=Female</th>
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<th>Q= Required</th>
<th>B= Both</th>
<th>Is Consent Returned</th>
<th>Is Student Fully Immunized</th>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>S</td>
<td>S</td>
<td>SBHC</td>
</tr>
</tbody>
</table>
Appendix F

Parent Structured Interview Guide

1. What is the role of the school clinic as far as your child’s immunizations?

2. What do you think is the best way for you to receive and return the immunization consent to the clinic?

3. What could the school clinic do to make things easier for you in keeping your child up-to-date on their immunizations?

4. Why do you believe that childhood immunizations are important?

5. Where have you received your information about immunizations for your child?

6. Is there anything else that you think it is important for me to know? Is there anything else I missed?
Appendix G

Second Parent Interview Guide

1. Describe for me what you feel is the purpose of a school based clinic?

2. Can you describe what kind of care is provided at the school clinic?

3. Describe for me what you know about childhood immunizations

4. Where have you received your information about childhood immunizations?
   
   Do you feel this information was given to you at your level of understanding?
   
   Why or why not?

5. Where has your child received his/her immunizations and why did you choose to have your child immunized at this location?

6. Do you think there is a difference between the doctor’s office and the school clinic for your child’s immunizations?

7. Describe any BENEFITS of having your child immunized at the school clinic?
   
   Any BARRIERS?

8. What do you feel is the role of the school nurse in providing immunizations for students in a school clinic?

9. Do you have any thoughts on what the school nurse could do to help parents with their child’s immunizations?

10. Is there anything else that you want to tell me that I have not asked?
October 16, 2017

Dear Patricia Lindner,

On 10/16/2017, the University at Buffalo IRB reviewed the following submission:

<table>
<thead>
<tr>
<th>Type of Review:</th>
<th>Initial Study</th>
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<tbody>
<tr>
<td>Title of Study:</td>
<td>Increasing Recommended Vaccines in School Based Health Centers</td>
</tr>
<tr>
<td>Investigator:</td>
<td>Patricia Lindner</td>
</tr>
<tr>
<td>IRB ID:</td>
<td>STUDY00001827</td>
</tr>
<tr>
<td>Funding:</td>
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| Documents Reviewed: | • Lindner HRP-503-Template Protocol.docx;  
|                  | • Lindner HRP-612.docx;  
|                  | • Timeline Table 1.docx;  
|                  | • Kaleida Approval for capstone.pdf;  
|                  | • Lindner Face to Face and Phone script for consents.docx;  
|                  | • Appendix A Kaleida Vaccine Consent for Jon Jones.pdf;  
|                  | • Appendix B VIS sheet meningoccal vaccine example.pdf;  
|                  | • Appendix C Parent Letter.docx;  
|                  | • Appendix D Data Collection Tool for Control;  
|                  | • Appendix E Data Collection Tool for Intervention Group.docx;  
|                  | • Appendix F Semi-structured Interview Guide.docx |

The IRB determined that the proposed activity is not research involving human subjects. IRB review and approval is not required.

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are being considered and there are questions about whether IRB review is needed, please submit a study modification to the IRB for a determination. You can create a modification by navigating to the initial submission and selecting ‘Create Modification / CR’.

If you have questions, please contact the UBIRB at 716-888-4888 or ub-irb@buffalo.edu. Please include the project title and number in all correspondence with the UBIRB.
Appendix I

White Paper

Improving the Return of Consents in School Based Health Clinics

Introduction:

- **9 out of 10** vaccine consents are not returned to the SBHC
- Strategies found in the literature that **improve** vaccination rates include
  - Making parent consents easy to understand
  - Reminders

Problem:

- Despite the availability of vaccines, > **45%** of students at BPS #89 SBHC are **lacking** recommended vaccines for their age
- Healthy People 2020 objective: to **increase** all adolescent recommended vaccines to **80%**

Background:

- Current immunization consent:
  - **Confusing & misinterpreted** by parents, teacher’s aides and teachers
- Kaleida vaccine consent:
  - **12th grade reading level** (Flesch Ease Readability Formula)
- Health information:
  - Recommended to be written at a **5th grade reading level** (Agency for Healthcare Research Quality)
Appendix I Continued

White Paper

Solution:

- Improve consent process
  - Adding a letter written at a grade 5 reading level to consent

- Interview parents
  - Consent process
  - SBHC role in their child’s immunizations
  - Opinions on SBHC
  - Beliefs about immunizations

Results:

- Consent process
  - Returned consents tripled after simple letter added to current consent

- Interviews
  - SBHC purpose/services were understood
  - Satisfaction with SBHC
  - Positive perceptions on immunizations
  - Recognized school nurse as credible, trusted & reliable health information source
  - Preferred consent sent home with their child

Conclusion:

- Educate nurses
  - Parent’s perceptions of SBHC role in immunizations
  - Parent’s perceptions of school nurses
  - Importance of collaboration with parents and teachers

- Initiate change in practice
  - Add simple parent letter to increase return of consents
Appendix I Continued

Works cited:


INCREASING RECOMMENDED VACCINES IN SCHOOL BASED HEALTH CENTERS
by Patricia Lindner, DNP(c), PNP-BC
Spring 2018

Purpose
• To implement an intervention in a School Based Health Center (SBHC)
  • to increase the number of returned parental immunization consents
  • to ascertain parent’s perceptions on SBHC immunization practices

Population:
• Parents of students who are enrolled in the SBHC at BPS #89 and are lacking one or more recommended vaccines

Intervention:
• Two-step intervention (Step 1: a short parent letter attached to the Immunization Consent and VIS, and then followed by Step 2: a mailed reminder to parents, if Step 1 is not returned)

Comparison:
• usual practice (sending immunization consents with the student to give to their parent)

Outcome:
• Increase in the number of returned parental consents for vaccines to SBHC, and identification of parent’s attitudes, feelings, about immunization practices and processes in the SBHC

Background
• In the United States vaccines prevent:
  • 12,000,000 illnesses/year
  • 800,000 hospitalizations/year
  • 28,000 premature deaths/year from preventable illnesses (Whitney, Zhou, Singleton, & Schuchat, 2014).
• One of the most successful ways to prevent & eradicate disease
• Centers for Disease Control (CDC) and Advisory Committee on Immunization Practices (ACIP)
• Individual states dictate school required vaccines
• Required vs. Recommended Vaccines
Background
- School Based Health Centers (SBHC)
- Buffalo Public School #89 SBHC
- Current Consent Form
- Costs

Literature Review

Advantages of SBHCs
- Key place to deliver vaccines (Williams et al., 2012)
- Realistic, replicable and convenient way to increase vaccination rates (Eldred et al., 2015; Altenhofen & Olney, 2016)
- An important vaccination resource, especially for those with limited access to vaccination (Daley et al., 2009)
- Targeted students can be easily reached while attending school in a timely and cost-effective way (Vandelaer & Olaniran, 2015)
- Higher vaccine uptake was consistently found in schools as compared to general practice (Crocker, Porten-Jones, McAlister, Roberts, & Cotterill, 2012)

Disadvantages of SBHCs
- Students are unaccompanied by parents
- Consents are most common barrier to vaccination (Moss et al., 2014)

Reminders
- Reminder calls for parental consents significantly increase immunizations in schools (Whelan et al., 2014)
- Mailing consent forms was an effective strategy for improving return of parental consents (Wilson, Sanchez, Blackwell, Weinstein, & Aron, 2013)
- Reminder and recalls vs. standard care (Kempf et al., 2012)
- Multi-faceted approach in SBHC for minority ethnic populations (Batista Ferrer, Trotter, Hickman, & Audrey, 2015)
- Mailing letters and capturing parents when they are present at school (Eldred et al., 2015)

Health Literacy
- Parents with low health literacy find it more challenging to understand health information (Chesser et al., 2012).
- Maternal education leads to better literacy skills and better health-seeking behaviors and this improves the receipt of immunizations in their children (Balogun et al., 2017)
- Initiatives which target the health literacy of mothers could improve vaccination coverage in their children (John et al., 2015)
- In vulnerable populations, an increase in literacy pertaining to vaccines, will serve to increase vaccination compliance (Arnold, Nahama, Puhipon, & Baron-Epel, 2017)
**Theoretical Framework**

Rosswurm and Larrabee (1999)

The Model for Change to Evidence-Based Practice

- Guides practitioners through the process of developing and integrating evidence-based practice change
- Composed of six constructs of change:
  1. Assess the need for a change in practice
  2. Link the problem/interventions and outcomes
  3. Synthesize the best evidence
  4. Design a practice change
  5. Implement and evaluate the change in practice
  6. Integrate and maintain the change in practice

**Application of Theoretical Framework**

1. Assess the need for a change in practice
   - Immunization rates
   - Return of consent rates
2. Link the problem/interventions and outcomes
   - Current consent
   - Parent letter
3. Synthesize the best evidence
   - Reminders
   - Health Literacy
4. Design a practice change
   - Improve patient outcomes
5. Implement and evaluate the change in practice
   - Two-step intervention vs. Routine practice
6. Integrate and maintain the change in practice
   - Evaluation of results
   - Dissemination

**Methodology**

**Design**

Mixed-methods exploratory design

- Quantitative: increase in returned consents
- Qualitative: how the current immunization process was working for parents

**Setting**

- Dr. Lydia T. Wright School of Excellence BPS #99
- Pre-kindergarten to grade 8, ages three through 15 years old
- 667 students enrolled in the school, and 586 (88%) have signed up for SBHC services (NYSDOH, 2017)
- Demographic: 87% Black, 3% White, 8% other, 1% Asian, and <1% American Indian (NYSDOH, 2017)
- Female 54% and Male 46% (NYSDOH, 2017)
- 42 students are in special education classes (Infinite Campus, 2017)
- > 50% of the students reside in four Buffalo zip codes of 14215, 14211, 14214 and 14208
- 100% of these students qualify for a free breakfast and lunch program (City-Data, 2017)
Methodology

Sample: Quantitative

**Inclusion**
- Students from grades 6, 7, 8
- Enrolled in the SBHC
- Lacking 1 or more ACIP recommended immunizations

**Exclusion**
- Students not lacking at least one ACIP recommended vaccine
- Lacking only an influenza vaccine
- Students “in-process”
- Written religious or medical exemptions to vaccinations

Forty-six percent of the SBHC students in grades 6, 7, and 8 met the inclusion and exclusion criteria (n=72)

Methodology

Sample: Qualitative

- Convenience sampling of parents of students from the SBHC at BPS #89
- All parents with a child enrolled in the SBHC were eligible to complete the interviews
- Parents were not recruited, but invited to participate, if they came into the SBHC or telephoned the clinic for any reason
- Parents whose children were not enrolled in the SBHC were excluded from the study

Parents who participated in the interviews (n=29)

Methodology

**Independent Variables**
- Two methods of sending out parental vaccine consents:
  1. Routine practice
  2. Intervention

**Dependent Variables**
- Three dependent variables:
  1. Was the consent returned
  2. Was the student fully immunized
  3. Who immunized the student

Methodology

**Quantitative**
- University at Buffalo Internal Review Board
- Homeroom lists
- SBHC enrollment list
- New York State Immunization Information System NYSIIS screening
- Alternately assigned
- Data collection tools
- Control group participants vs. intervention group participants
Research Procedures

Qualitative
- Structured interview guide
- Parents were invited to participate
- Voluntary participation
- Initial interviews lasted <10 minutes
- Second interviews lasted 10-15 minutes

Results

Quantitative

Demographic Characteristics
- 72 students eligible
- 36 students in control group
- 36 students in intervention group

Types and Necessity of Vaccines
- 114 vaccines were lacking
- HPV (56.5%)
- Recommended vaccines (66.7%)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Group</th>
<th>Intervention Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<tr>
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<td>2</td>
<td>9</td>
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</table>

Chi-square Test of Independence for Dependent Variables

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Note: N = 72. Significance level not at p < .05.
Results

Qualitative
Initial Structured Interviews
- 25 parents
- Coding guide
- Questions were analyzed for content
- Key themes

Second Structured Interviews
- Parent’s thoughts and opinions about the SBHC’s purpose
- Inductive content analysis

Results

Purpose of the Qualitative Component
- Findings

Discussion

Purpose of the Quantitative Component
- Findings

Dissemination

Purpose of the Qualitative Component
- Findings

Implications to Practice
- Advanced Practice Nurses (APN)
- Interprofessional collaboration
- Leadership to improve evidence-based patient outcomes
- Advocate for disparate populations
- Credibility as a trusted resource
- Health education in SBHC
- Quality improvements
Strengths and Limitations

**Strengths**
- Design
- Replication
- Contribution to existing literature
- Reliability
- Objectivity

**Limitations**
- Fully immunized results
- Generalizability
- Study duration
- Threats to external validity
- Time constraints of interviews
- Convenience sampling of parents
- Researcher bias

Conclusions

- Recommended vaccines
- SBHCs
- Reliable source of health information
- Effective strategies
- Collaborate with parents
References


References


References


