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Strategies for Teaching New Mothers the Importance of Vaccination

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Abstract

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MS, Walden University, 2016

BS, Bowie State University, 2007

Project Submitted in Partial Fulfillment

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Abstract

Vaccinations provide protection against a number of severe childhood communicable diseases, such as polio, measles, and pertussis. However, not all parents follow the recommended immunization schedules for their young children, a decision which could lead to increased disease incidence and prevalence. The purpose of this DNP project was to address the gap-in-practice related to ineffective strategies to reduce vaccination refusal among parents. This systematic review sought to understand strategies effective at teaching new mothers the importance of vaccinating their children. The theoretical foundation for addressing this question is Rogers' protection motivation theory, which explains that sources of information, mediating cognitive processes, and modes of coping all contribute to an individual's willingness or refusal to engage in protective behaviors. The evidence aimed at answering the practice-focused question was obtained through a search of Walden library databases. The PRISMA flow diagram and the Revised Standards for Quality Improvement Reporting Excellence tool were used to organize and evaluate relevant interventions. Three studies met the inclusion criteria. While none of these studies reported an increase in vaccination rates, the findings indicate that educational interventions, including videos, handouts, and tailored messages presented on the Internet are effective at promoting a more positive attitude towards vaccination. This project supports positive social change by helping to improve the health of the population and reduce current disparities in immunization rates.

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Section 1: Nature of the Project

Introduction

Childhood immunizations are an essential strategy in fighting infectious diseases. In recent decades, vaccines have been responsible for preventing millions of deaths and morbidities, as well as reducing billions of dollars in direct and indirect costs associated with disease (Amanna & Slifka, 2018; Whitney et al., 2014). However, not all parents recognize the importance of adhering to childhood immunization schedules. One in five children do not receive the complete number of recommended vaccines, and 1.3% of children in the United States remain unvaccinated (Hill et al., 2019). Parental education can play a significant role in improving these rates; however, there is a lack of adequate evidence to support the use of any specific educational intervention (Sadaf, Richards, Glanz, Salmon, & Omer., 2013). This DNP project will utilize a systematic review of the literature to uncover evidence to support the use of practical educational interventions for new parents. This project supports positive social change by helping to improve the health of the population and reduce current disparities in immunization rates (Hill et al., 2017).

Problem Statement

Vaccinations provide adequate protection against several severe childhood diseases, including polio, measles, rubella, hepatitis, mumps, and varicella (Kennedy et al., 2011). However, not all parents follow the recommended immunization schedules for infants and young children. The effects of the decision to refrain from vaccination were recently observed in the 22 measles outbreaks in the United States in 2019, in which

1,249 individuals were infected with the virus (Hill et al., 2019). One positive outcome of this outbreak was an increase in parental confidence regarding vaccines and support for mandates among individuals aware of the outbreak (MacDonald et al., 2018). However, as stated in the most recent National Immunization Survey, only 80.3% of children receive the recommended four doses of DTaP by the age of 24 months, which represents a 0.4% decline in vaccination rates between 2013 and 2015. (Hill et al., 2019). One in five children do not complete the full series of Haemophilus influenza vaccinations, and one in 10 children do not receive a varicella vaccine or the entire set of treatments for hepatitis B (Hill et al., 2019). Furthermore, 1.3% of children in the United States receive no vaccinations at all (Hill et al., 2019), leaving approximately 49,000 children born in 2018 at risk for morbidity and mortality due to preventable diseases (Centers for Disease Control and Prevention, 2018).

Similar gaps in vaccination coverage exist in the state of Maryland. In 2014, 77.8% children between the ages of 19 and 35 months received the four doses of immunizations, such as doses of diphtheria vaccine, three doses of the polio vaccine, one dose of measles vaccine, three doses of Hib vaccine, and one dose of varicella vaccine (The Governor's Office for Children, n.d.). While this percentage was above the national level at that time of 74.6% (The Governor's Office for Children, n.d.)., it still falls short of the Healthy People 2020 target of approximately 90% vaccination coverage (Office of Disease Prevention and Health Promotion, 2020).

Several reasons may explain the refusal of parents to vaccinate their children. Common concerns include vaccine safety, side effects of vaccines, the potential for

vaccines to cause chronic disease, and the perception that most children will never contract the diseases for which vaccines exist or that these diseases are not serious (Kennedy et al., 2011). These erroneous perceptions may be due to inadequate parental education about vaccines, as they are deemed safe and effective (Hill et al., 2019). Also, a gap in the literature exists regarding effective strategies to reduce vaccination refusal among parents (Sadaf et al., 2013). The health and welfare of the population, including the very young and vulnerable, is of paramount concern to the nursing profession. In this DNP project, I seek to further population health by providing research-based evidence regarding educational interventions for teaching the importance of vaccination to new mothers.

Purpose

The purpose of this doctoral project is to address the gap-in-practice issue related to the lack of effective strategies to reduce vaccination refusal among parents (Sadaf, et al., 2013). Sadaf et al. (2013) conducted a systematic review of 17 studies about parental education of vaccination. About one-half of these studies reported a positive impact on vaccination rates by new parents, while the rest reported no improvement or inconclusive findings. Furthermore, the only two randomized, controlled trials included in this review demonstrated flaws in study design, and thus the results may be unreliable. The author concluded that a lack of high-quality evidence on effective strategies to reduce parental vaccine refusal existed (Sadaf et al., 2013).

Based on these findings, the practice-focused question that will address the gap in the literature about effective strategies to reduce vaccination refusal rates among parents,

including new mothers, is: What strategies are effective at teaching new mothers the importance of vaccinating their children? This question directly relates to the gap in practice as it seeks to identify educational strategies that are effective at conveying the importance of immunizations to a specific population: new mothers.

Nature of the Doctoral Project

I conducted a systematic review of the literature by searching academic and professional databases, including The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, ProQuest, PubMed, and Google Scholar. Additional evidence was obtained from government websites and other publicly available information, such as the Centers for Disease Control and Prevention. The purpose of this search was to identify and critically analyze current and primary evidence, which was used to answer the following question: What strategies are effective at teaching new mothers the importance of vaccinating their children?

Walden's Manual for Systematic Review (2019) was used as a framework to conduct a systematic review and answer the research question. Briefly, the steps to conducting this review include: (a) creating a research question, (b) identifying the scope of the review, including the databases which will be searched, the keywords and phrases used to conduct the search, and strategies to appraise the quality of studies, (c) defining the inclusion and exclusion criteria for the studies, (d) performing a comprehensive search of the literature to identify all relevant studies, (e) selecting the most pertinent studies which meet the inclusion criteria, (f) appraising the quality of the evidence and organizing key details about each included study, (g) summarizing and synthesizing the

evidence, and (h) developing recommendations for future practice. It is expected that this systematic review will uncover valid and reliable evidence educational interventions regarding vaccination that directly address the gap-in-practice related to a lack of such interventions for new parents. These interventions were disseminated to primary practice providers using a variety of strategies, including publication in peer-reviewed journals (McVay, et al., 2016) and social media (Dyson, et al., 2017; Hand, et al., 2016).

Significance

Vaccines are an essential and necessary part of global health. Not only have vaccines eradicated smallpox, but they also prevent 33,000 deaths and 14 million cases of the disease annually (Amanna, & Slifka, 2018). Between 2011 and 2020, it is estimated that vaccines will have prevented 23.3 million deaths worldwide (Amanna & Slifka, 2018). For children born between 1994 and 2013, it is estimated that vaccines will prevent 322 million illnesses, 21 million hospitalizations, and 732,000 deaths. Vaccines among this cohort will save the United States $295 billion in direct costs and $1.38 trillion in indirect costs (Whitney et al., 2014). The seroconversion rates, or the development of detectable antibodies in the blood, for measles, mumps, and rubella, are 97. %, 96.0%, and 98.8%, respectively, attesting to the effectiveness of these vaccines. Hepatitis A, once a leading cause of viral hepatitis with a fatality rate of 1.8%, is now well controlled, with the rate of disease declining over 90% since the introduction of the vaccine (Amanna, & Slifka, 2018). More recently, the human papillomavirus (HPV) vaccine has demonstrated the efficacy of up to 98% in protecting against viruses that cause cervical cancer and genital warts (Amanna, & Slifka, 2018; Dochez et al., 2014). It

is important to know that vaccines offer effective protection against morbidity and mortality. It is for this reason that it is essential for all parents to follow the recommended vaccination schedules for their children.

Despite the importance of vaccines, not all parents ensure that their children receive this protection. Twenty percent of children do not complete the full series of Haemophilus influenza vaccinations, and 10% of children do not receive a varicella vaccine or the full series of vaccinations for hepatitis B. Just over 1% of children are completely unvaccinated (Hill et al., 2019).

Vaccinations impact a number of stakeholders and are an important component of nursing practice. Stakeholders include not only children and their families who may be impacted by the burden of disease arising from inadequate vaccination, but also individuals who may be unable to receive vaccines due to underlying health conditions. Because disease causes economic burden, the whole of society is impacted by the outbreak of diseases that could be prevented through immunizations. Given that both individual and public health are important concerns for the nursing profession (American Association of Colleges of Nursing, 2006), this project will positively impact nursing practice. An effective intervention aimed at encouraging new mothers to adhere to immunization recommendations will help to improve the health of the nation's children and adults.

This project has potential implications for other practice areas, as well as for promoting positive social change. Effective educational interventions that target reluctant healthcare consumers may be useful in promoting medication adherence among patients

with chronic disease. For example, medication nonadherence is a concern among heart failure patients, leading to disease exacerbation, impaired physical function, and increased risk for hospitalization and death (Ruppar et al., 2016). With respect to positive social change, this project will promote improvements in population health and help to eliminate disparities in vaccination rates among Black and Hispanic children, as well as low-income children (Hill et al., 2017). As such, this project addresses potential racial, ethnic, and socioeconomic disparities in vaccination rates. This social change will benefit infants and young children by preventing childhood disease, particularly those who are members of vulnerable racial and ethnic populations, and benefit the public in general by building herd immunity (Betsch et al., 2017).

Summary

Nurses are committed to the health and well being of those they serve, as well as ensuring the health and safety of the public. Vaccines provide essential protection for young children, as well as all youth and adults, against potentially life-threatening infectious diseases. The reluctance by some parents to adhere to immunization recommendations is one area in which nurses can make a significant and positive difference through effective educational interventions. In the following section, I will provide greater insight into the issue of vaccine nonadherence and potential evidence-based solutions.

Section 2: Background and Context

Introduction

Vaccinations play an essential role in preventing infectious diseases, such as measles, polio, and pertussis. However, not all parents follow the recommended immunization schedules for their children, leaving a significant percentage of children unprotected. For example, approximately 20% of children do not receive the recommended doses of DTaP (diphtheria, tetanus, and pertussis) by the age of 24 months, and 1.3% of children receive no vaccinations at all (Hill et al., 2019). Diverse reasons may exist for this lack of vaccinations, including parental concerns about vaccine safety and side effects, the potential for the vaccine to cause disease, and the perception that the child may never contract the disease anyways (Kennedy et al., 2011). Parental education may be the most effective way to counter these concerns and increase vaccination rates; however, a missing piece in the literature exists concerning effective educational strategies to reduce vaccine refusal among parents (Sadaf et al., 2013). The aim of the doctoral project is to address this gap in the literature through a systematic review of the research, which seeks to answer the following practice-focused question: What strategies are effective at teaching new mothers the importance of vaccinating their children? In the following sections, I provide an overview of relevant theory and background, a discussion of the relevance of the issue to nursing practice, and consideration of the role of the DNP student in the project.

Concepts, Models, and Theories

Roger's (1983) protection motivation theory provides the theoretical foundation for understanding parental refusal to vaccinate. This theory, which seeks to explain why individuals engage in or refuse to participate in protective behaviors, contains three domains. The first domain, sources of information, refers to the types of information that elicit the decision-making process. This information may be environmental, such as verbal persuasion by others or observations of others, or intrapersonal, such as personality traits or experience with similar threats (Rogers, 1983). The second domain, mediating cognitive processes, refers to the appraisal and decision-making processes that occur. For an individual to initiate a protective behavior, they must believe: (a) the threat is severe, (b) they are vulnerable to the danger, (c) they can perform the coping response (self-efficacy), (d) the coping response will be useful, (e) the factors that make a maladaptive response less likely to outweigh the rewards of making that maladaptive response, and (f) the factors that increase the probability of making an adaptive response outweigh the costs of that adaptive response (Rogers, 1983). The third domain of the theory is coping modes, which refers to the behaviors enacted in response to the motivation to protect oneself. These behaviors can occur only once or multiple times may involve a single act or various acts and may involve action or the inhibition of activity (Rogers, 1983).

Relevance to Nursing Practice

Parental vaccine refusal has been an issue since the development of vaccines. During the latter part of the 19th century, as smallpox outbreaks occurred, intensive

vaccination campaigns were met with significant opposition. In 1982, a documentary called, "DTP: Vaccination Roulette," which claimed that the pertussis component of the vaccine caused brain damage and seizures in children, further ignited vaccination refusal sentiments. Just over a decade later, a group of researchers claimed an association between the MMR vaccine and autism, sparking additional concern among parents (Dube, Vivion, & MacDonald, 2015). Events such as these have created cognitive biases that influence parents' perceptions about vaccines, promoting the belief that the risks associated with receiving a vaccine outweigh the risks associated with the diseases they are created to prevent. These beliefs can have significant and negative consequences, as countries in which antivaccination sentiments are prominent demonstrate a 10 to 100-fold increase in pertussis cases (Dube et al., 2015).

Nurses play an important role in communicating the benefits and risks of vaccines to parents. In many primary care practices, it is the nurse who vaccinates the child and explains the potential side effects of the vaccine to parents prior to the vaccination. In the school and public health settings, nurses often lead immunization programs, which include parental education (Hoekstra & Margolis, 2016). Furthermore, nurses are trained in communication strategies, such as establishing rapport with clients and showing respect and empathy for a client's viewpoint. This form of therapeutic communication enables parents to fully participate in the decision-making processes regarding their children (Hoekstra & Margolis, 2016). In addition, nurses are perceived as having high degrees of compassion and are ranked highly among occupations for honesty, ethical

integrity, and trust. Vaccination messages received from trustworthy sources are more likely to exert positive influence (Hoekstra & Margolis, 2016).

Healthcare professionals have addressed vaccine refusal through a number of strategies. Gagneur et al. (2018) utilized motivational interviewing within the context of an educational intervention for new mothers during their postpartum stay in the hospital. Results indicated that the intervention was associated with a slight but significant increase in vaccination rates at seven months (Gagneur et al., 2018). Other strategies include patient-centered education programs, written educational interventions, the use of the Internet and social media to promote vaccination, and text-messaging and computerized reminders. However, the evidence supporting the efficiency of these strategies is low to moderate quality (Dube, Gagnon, & MacDonald, 2015). This project seeks to fill the gap in practice by conducting a thorough search and critique of existing interventions in order to determine which possess a high quality of evidence.

Local Context and Background

Gaps in vaccination coverage are an issue within the state of Maryland as they are nationwide. The Maryland Department of Health (2019) recommends that children between birth and six years receive: three doses of hepatitis B vaccine, three doses of rotavirus vaccine, five doses of DTaP vaccine, four doses of Haemophilus influenza type B vaccine, four doses of the pneumococcal conjugate, four doses of inactivated poliovirus, and two doses each of MMR, varicella, and hepatitis A. In this state, just over three-fourths of children, or 77.8%, receive the full-recommended immunization schedule. In spite of the fact that this percentage is slightly higher than the national

levels, it still fails to meet the Healthy People 2020 guidelines of 90% vaccination coverage (The Governor's Office for Children, n.d.; Office of Disease Prevention and Health Promotion, 2020). Further evidence for gaps in vaccination coverage in Maryland includes a three-fold increase in the number of pertussis cases between 2013 and 2014 (United Health Foundation, 2020).

Role of the DNP Student

As a Nurse Practitioner with over 30 years of experience in healthcare, particularly within healthcare administration, I have a passion for improving the health of the population. I currently serve within a pediatrics practice and often communicate with parents about childhood immunizations. I have witnessed a number of parents express uncertainty and fear regarding immunizations, including effectiveness, potential side effects, and the potential harm of administering multiple vaccinations concurrently. This DNP program has helped me to hone my leadership skills and ability to be an agent of social justice, and I want to apply these skills to improve vaccination rates in my state and community by educating parents. I intend to identify effective and high-quality interventions that will promote improved vaccination practices among new mothers and then apply those interventions within my own practice. This desire to identify effective interventions may represent a bias that could impact the results of my project. To prevent this bias from affecting my results, I intend to objectively critique the quality of each study included in my systematic review using an established analysis tool. It is my sincere hope that the results of this DNP project will impart positive change within my community and improve the health of one of the most vulnerable groups – children.

Summary

Vaccinations play a key role in protecting population health. However, despite current recommendations, not all parents consent to vaccinations. Inadequate parental education regarding the importance of immunization may be a significant underlying cause of vaccine refusal. This DNP project seeks to evaluate the effectiveness of educational interventions aimed at teaching new mothers the importance of vaccinating their children and arrive at a recommendation that can be implemented in this student's professional practice. In the following section, I will provide a discussion of the current evidence pertaining to this issue.

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Section 3: Collection and Analysis of Evidence

Introduction

Although childhood immunizations play a critical role in preventing disease, not all children are afforded this protection. For a variety of reasons, such as concerns regarding vaccine safety or the potential for the vaccine to cause disease, some parents choose not to vaccinate their children (Kennedy et al., 2011). In fact, up to 20% of children in the United States do not receive the full course of immunizations recommended by the Centers for Disease Control and Prevention (Hill et al., 2019). Parent education may be an effective way to combat fears and improve the health and safety of children. My purpose in this doctoral project was to evaluate the quality and effectiveness of existing educational interventions, of which the goal was to reduce parental vaccination refusal or hesitancy. The following sections describe the data collection and analysis process used to answer the practice-focused question.

Practice-Focused Question

Vaccinations are an important tool in the arsenal of public healthcare providers in preventing disease. For example, an increase in the global vaccination rate for measles from 20% in 1981 to 90% in 2012 resulted in a decline in measles from 4.5 million cases annually to 200,000 cases annually (Greenwood, 2014). Despite results such as this, some parents remain concerned about the potential risks and side effects associated with vaccines. A prominent controversy arose in 1998 when researchers published the results of a small study that concluded that a link existed between the measles/mumps/rubella vaccine and childhood autism. However, later evidence revealed that not only was the

study lacking in validity due in part to its small sample size, and the researchers also published fraudulent results (Knopf, 2017). Deception such as this may contribute to misinformation among parents and reduced vaccination rates.

The issue of parental vaccine hesitancy and refusal affects the state of Maryland. In 2014, about 22% of children between the ages of 19 and 35 months did not receive the full-recommended schedule of vaccines (The Governor's Office for Children, n.d.). As such, the state fell short of the Healthy People 2020 objective of 90% vaccination coverage among children (Office of Disease Prevention and Health Promotion, 2020).

This failure to meet national goals for vaccination rates may be due in part to a dearth of effective interventions aimed at parents and promoting immunization. A gap exists in the literature regarding effective strategies to reduce vaccine refusal by parents, including parents-centered information and education (Sadaf et al., 2013). The purpose of this DNP project is to identify and evaluate the quality of educational interventions, particularly those published since the contentions of Sadaf et al. (2013), aimed at reducing parental vaccine refusal and hesitancy. More specifically, the project sought to answer the following practice-focused question: What strategies are effective at teaching new mothers the importance of vaccinating their children?

Sources of Evidence

The evidence used to support this DNP project originated primarily from peer-reviewed studies that address the topic of interventions used to reduce vaccine refusal or hesitancy among parents. A systematic review of the literature was conducted by searching the MEDLINE, CINAHL, Embase, Proquest, Science Direct, and Google

Scholar databases. Additional supporting evidence was obtained from government sources, including the Centers for Disease Control and Prevention and the Office of Disease Prevention and Health Promotion. The data from these sources were used to identify, critically analyze, and evaluate the quality of interventions aimed at answering the practice-focused question: What strategies are effective at teaching new mothers the importance of vaccinating their children? This analysis provided the foundation for the development of an intervention aimed at improving the vaccination rates of children in the community.

Published Outcomes and Research

The following electronic databases were searched to collect evidence: MEDLINE, CINAHL, Embase, Proquest, Science Direct, and Google Scholar. The following search terms and strategy were used to locate relevant studies: *parent* AND (*immunization* or *vaccine* or *vaccination*) AND (*refusal* OR *hesitancy*) AND *educational intervention*. The time frame searched was from January 1, 2013 to the present time. Results will be further limited to publication in the English language. In addition to peer-reviewed sources, statistics from the Centers for Disease Control and Prevention and the Office of Disease Prevention and Health Promotion were used to support the justification of the problem. Collectively, the data retrieved from these sources were used to answer the question: What strategies are effective at teaching new mothers the importance of vaccinating their children?

Analysis and Synthesis

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow-chart was used to record and describe the identifiable articles (Moher et al., 2009; White & Dudley-Brown, 2012). Studies with missing data were excluded from the review. The Revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) was used to organize and evaluate relevant interventions (Ogrinc et al., 2016).

Summary

A systematic review of the literature was conducted in accordance with Walden University guidelines in order to address a gap in the literature pertaining to effective educational interventions for parents to reduce vaccine refusal or hesitancy. This data will serve as the basis for program planning efforts to improve the vaccination rates of children in the state of Maryland and the local community. In the next section, I discuss the findings of this review, implications for nursing practice, a recommended solution, and the strengths and limitations of this project.

Section 4: Findings and Recommendations

Introduction

Although vaccinations can provide effective protection against childhood diseases, such as measles, rubella, or polio, not all parents follow the recommended immunization schedules (Kennedy, et al., 2011). Nationwide, only 80.3% of children receive the recommended four doses of the DTaP vaccine by the age of 24 months (Hill et al., 2019). In Maryland, only 77.8% of children between the ages of 19-35 months receive the recommended four doses (Governor's Office for Children, n.d.). Unvaccinated children are at risk for acquiring and passing along communicable diseases. The purpose of this project was to address the gap in practice related to a lack of effective strategies to reduce vaccine refusal or hesitancy among parents (Sadaf et al., 2013). In this project, I sought to answer the following practice-focused question: What strategies are effective at teaching new mothers the importance of vaccinating their children?

The sources of evidence used to address this question included three randomized, controlled trials regarding educational interventions for parents who indicated vaccine hesitancy or refusal. This evidence was obtained by searching professional databases, including MEDLINE, CINAHL, Embase, Proquest, Science Direct, and Google Scholar databases. I used the following search strategy: *parent* AND (*immunization* or *vaccine* or *vaccination*) AND (*refusal* OR *hesitancy*) AND *educational intervention*. I organized and evaluated studies retrieved by this search using The Revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0; Ogrinc et al., 2016).

Findings and Implications

The search identified 221 articles, of which I screened the titles and abstracts for eligibility. After removing duplicates, I then assessed 105 articles for eligibility based on a review of the full text. A flow diagram of the study search and selection process, as well as reasons for exclusion, is shown in Figure 1. The characteristic of the final studies selected for inclusion is shown in Appendix A.

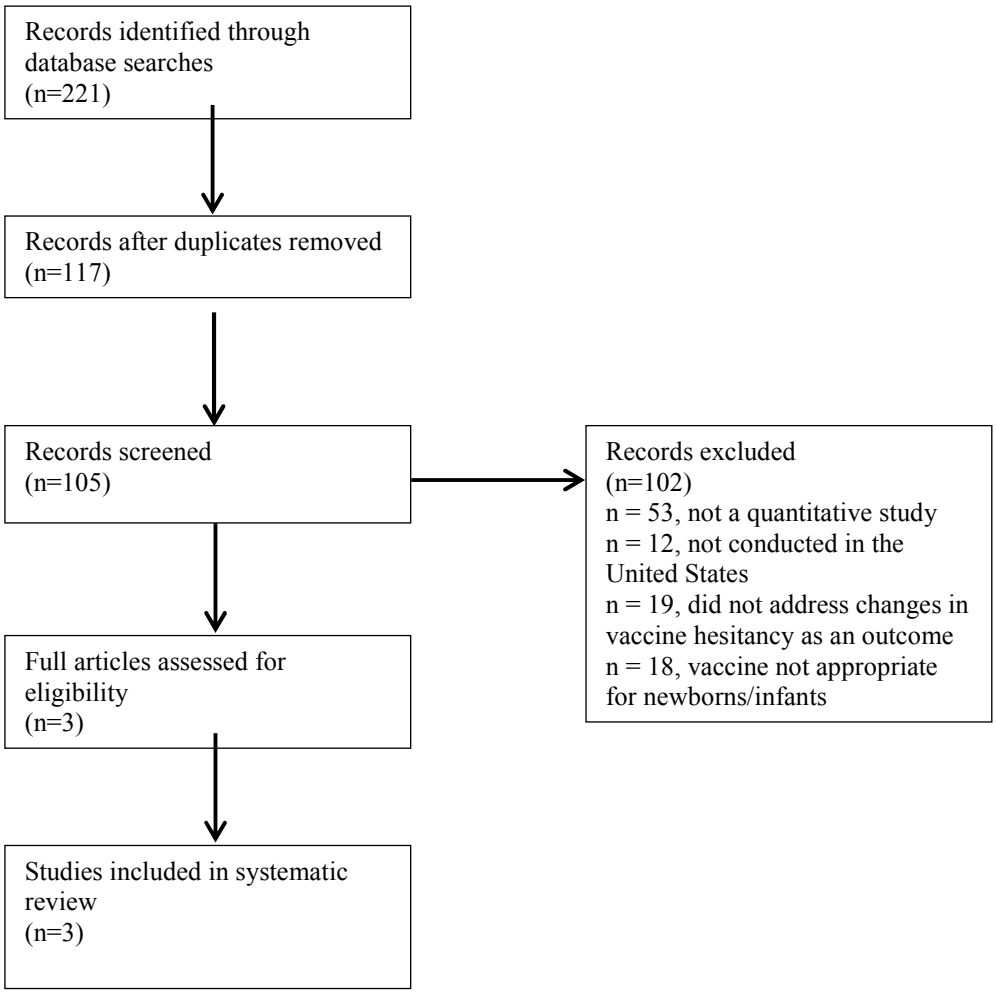

Figure 1. PRISMA flow diagram.

The findings from this systematic review of the literature indicated that a gap-in-practice might still remain regarding the use of educational interventions to reduce

vaccine refusal or hesitancy among new mothers. None of the three studies included in this review reported any actual changes to vaccination rates (Gowda et al., 2013; Nyhan et al., 2014; Williams et al., 2013). Educational interventions presented using the Internet may increase the intention to vaccinate regardless of whether the material is tailored specifically to the individual parent and child (Gowda et al., 2013). In addition, a multifaceted intervention consisting of an educational video, educational handout, and a list of Internet resources may also improve parental intention to vaccinate (Williams et al., 2013). However, none of these studies reported an actual increase in vaccination rates in the week after the implementation of the intervention. Furthermore, a provaccine educational message may, in some cases, actually reduce the intent to vaccinate. Nyhan et al. (2014) reported that parents with existing negative views regarding childhood vaccination indicated a decrease in intent to vaccinate after viewing educational messages refuting perceptions that vaccines were not safe or images or narratives of children sick due to lack of vaccines. Thus, while some educational strategies, such as videos, Internet pages, and handouts may increase the intention to vaccinate; it is not known to what degree they increase actual vaccination rates.

One unanticipated outcome in Nyhan et al.'s (2014) study was the decrease in intent to vaccinate among parents with the least positive attitudes toward vaccination after viewing a message that corrected misconceptions about vaccine safety. More specifically, although the educational message successfully corrected the misconception that the MMR vaccine is related to autism, parents with the least favorable attitudes about vaccines decreased in their intent to vaccinate, though this was not true of parents with

the most favorable attitudes (Nyhan et al., 2014). Nyhan et al. suggested that this might occur as parents find other concerns to perpetuate their negative misconceptions about vaccines.

These findings have implications for multiple levels of society. From a health system and individual healthcare practice standpoint, educational interventions may improve parental attitudes without improving actual vaccination rates. As such, additional research is needed by healthcare researchers to identify additional and effective interventions. This suggests that current educational interventions may not improve community health with respect to childhood communicable diseases. From an individual standpoint, educational interventions may improve parental attitudes, but these improved attitudes may not translate into a greater willingness to actually vaccinate their children.

These results are not without positive connotations regarding social change. Educational interventions, including videos, handouts, and tailored messages presented on the Internet are effective at promoting a more positive attitude towards vaccination. This attitude may be the first step in improving actual vaccination rates for children, which would help to reduce the incidence of childhood diseases and improve population health.

Recommendations

The proposed recommendation to address the gap-in-practice is to create a web-based resource that may or may not be tailored to the specific characteristics of the family, to educate parents on the benefits of vaccinating their children. However, because

initial parental attitudes towards vaccination may determine how the parent reacts to the material, it is helpful to first assess these attitudes. Among those with less positive attitudes, messages that seek to correct vaccine safety misconceptions or scare parents through the use of images or narratives may be ineffective. Furthermore, it is worth noting that although educational interventions may improve parental attitudes, there is a lack of evidence indicating that they improve vaccination rates. Not only is additional research needed to address this gap, a different focus may prove beneficial. Protection motivation theory identifies a number of beliefs that must exist in order for an individual to engage in protective behavior, such as vaccinating a child. Additional research should focus on the role of these factors, particularly self-efficacy and the perceived risks and rewards associated with vaccinations (Rogers, 1983).

Strengths and Limitations of the Project

This project was associated with several strengths and limitations. Strength was the inclusion of recent studies within the past 7 years such that the results reflect current attitudes and vaccine intentions. In addition, the three studies included in this review were randomized, controlled studies, which represent a high level of quality. Despite these strengths, several limitations existed. Only three studies were ultimately included in the systematic review, and it is difficult to draw generalizable conclusions from this small sample. In addition, only one of the studies included in the review assessed for actual changes in vaccination rates, which is the desirable outcome of educational interventions. Future studies should address this outcome in addition to changes in parental attitudes.

Section 5: Dissemination Plan

Plan for Dissemination

This DNP project was designed to address a gap in the literature regarding effective strategies to reduce vaccine refusal among new mothers. These results will be disseminated to the clinic at which I am employed as well as to a broader audience of professionals within the nursing field. This clinic supports the value of disseminating professional work and expresses the expectation that healthcare professionals who perform research will share the results with the clinic staff, which are two key facilitators of dissemination (McVay et al., 2016). The results from this systematic review of the literature will be presented as a staff workshop to the nursing professionals associated with primary care at this clinic.

A social media platform will be one strategy used to disseminate information to other family nurse practitioners throughout the profession. This strategy will be similar to that used by Dyson et al. (2017), who created weekly blog posts using Word Press along with regular Tweets using Twitter in order to disseminate evidence to pediatric healthcare providers. Research suggests that healthcare professionals use social media to gather and communicate professional information (Dyson et al., 2017; Hand et al., 2016). In addition to creating a series of blogs addressing educational strategies to reduce vaccine refusal among new mothers, a set of Tweets will be constructed and posted to twitter using hashtags relevant to the topic of childhood immunizations. The Tweets will also direct readers to the blog posts.

A second dissemination strategy is publication in a peer-reviewed journal. Journals will be selected based on their target audience, which should include family nurse practitioners, and the editors of these journals will be queried. This project used PRISMA to report the results of the search and study selection process (Moher et al., 2009; White & Dudley-Brown, 2012); however, additional guidelines for individual journals will be obtained and the format of the existing project modified to meet these guidelines.

Analysis of Self

My purpose in this DNP project was to identify effective strategies for educating new mothers on the importance of vaccinating infants. Legislation that mandates vaccination could be challenging from operational, legal, and ethical perspectives to adopt and medical exemptions may enable some parents to forego vaccines for their children (MacDonald et al., 2018). Healthcare providers may play an important role in reducing gaps in immunization coverage by ensuring that parents receive accurate and current information. My role in furthering this goal through this project helped me to develop a number of key AACN (2006) competencies related to clinical scholarship, organizational leadership, and improving patient and population health outcomes.

The process of performing a systematic review of the literature in order to identify effective parental education strategies has strengthened my role as a practitioner, scholar, and project manager. My role as a practitioner helped me to identify a need within a target population in my own practice. As a scholar, I strengthened my skills related to research, critical appraisal of evidence, and the synthesis of evidence associated with a

significant health issue. Finally, as a project manager, I strengthened my critical thinking, time-management, planning, and communication skills. These skills helped me to overcome the challenge of identifying and reviewing a large number of research studies to determine inclusion in the systematic review. While this project is the culmination of work during my DNP journey, I am excited to implement these skills as I move forward in my career to address additional healthcare needs as they arise.

Summary

Immunizations provide effective protection against communicable childhood diseases. However, a notable percentage of children do not complete the full-recommended immunization schedule, leaving them and the public at risk for disease. Healthcare providers should work to promote a positive attitude among parents regarding vaccination through education about safety and effectiveness. Additionally, research is needed to determine if improved parental attitudes will translate into increased vaccination rates.

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Appendix: Characteristics of the Studies

Study and Level of Evidence (LOE)						
Problem Description	Aim of Study, Sample, Setting	Study Design and Intervention	Ethical	Results	Limitations	Conclusions
Gowda, et al. (2013) A pilot study on the effects of individually tailored education for MMR vaccine-hesitant parents on MMR vaccination intention – LOE II						
An increasing number of parents perceive that safety and health threats related to vaccines are greater than those related to diseases, such as measles, mumps, and rubella (MMR), leading to increased parental indecisions and hesitancy about vaccinations	The aim of this study was to determine the effect of an individually tailored Internet-based intervention at improving MMR vaccination intentions among vaccine-hesitant parents Sample: n=77 (36 in intervention and 41 in control); included parents older than 18 years with children younger than 6 years; 54% of children were between birth and 12 months	RCT Intervention: Based upon pretest information, parents in this group were granted access to web pages about vaccine promotion that tailored images to the race of the parent, tailored content based on parental concerns, reflected parents' past experiences, and incorporated the child's name throughout the content	Study procedures were approved by the IRB One of the authors has served on advisory boards for Merck and Pfizer	A greater percentage of parents in the tailored versus the non-tailored group indicated positive vaccination perceptions after viewing the educational materials (58% vs 46%, $p>0.05$) Parents in the tailored intervention group demonstrated a greater increase in intent to vaccinate than the non-tailored control group ($p>0.05$) Within group comparisons indicated that parents in both groups	Small sample size; inclusion of parents with positive intentions at baseline Single setting and consideration of only the MMR vaccine limits external validity	MMR vaccine-hesitant parents demonstrated increased intention to vaccinate after viewing educational materials on the Internet, particularly if the materials were individualized to the family. However, individualization of educational materials does not demonstrate a statistically significant difference when compared with no individualization

	Setting: convenienc e sample recruited from waiting rooms of primary care clinics within the University of Michigan Health System			demonstrate d an increase in positive intention to vaccinate after viewing educational materials (interventio n group p=0.01; control group p=0.0001)		
Nyhan, et al. (2014) Effective messages in vaccine promotion: A randomized trial. – LOE II						
Misinformatio n exists in society about the MMR vaccine, which may lead to lower vaccination rates or groups of unvaccinated children.	The aim of this study was to test the effectivenes s of educational messages in increasing vaccination rates for MMR Sample: n = 1759 parents over the age of 18 years with children under the age of 17 years Setting: national online panel recruited based on random phone number dialing and address-based sampling	RCT; pretest/ posttest Intervention: Subjects were randomly assigned to receive one of four pro-vaccine messages or a control message. The four intervention messages corrected misinformatio n, gave information about disease risks, presented a dramatic narrative, or used visuals to indicate risks of non-vaccination	The IRB classified this study as exempt; all participant s signed an informed consent form	None of the four intervention s increased intent to vaccinate with MMR. Refuting claims about the safety of the MMR vaccine led to reduced intention to vaccinate, particularly among parents with the least favorable vaccination views ($p<0.05$).. Images of sick children increased the belief in the connection between the MMR vaccine and autism.	Self-reported beliefs about intent to vaccinate may be subject to bias or inaccuracies	None of the pro-vaccine messages in this study increased the intent to vaccinate. Corrective information about vaccine safety reduced misconceptions but led to decreased intent to vaccinate. Images or narratives about sick children increased beliefs about negative side effects of vaccines. Messages should be tested before being used with the public.

Williams, et al., (2013) A randomized trial to increase acceptance of childhood vaccines by vaccine-hesitant parents: A pilot study – LOE II						
While parents prefer to receive vaccine information from their healthcare providers before their first visit, time restrictions make it difficult for providers to fully address all concerns.	The aim of the study was to test an educational tool to address concerns among vaccine-hesitant parents at the time of the two-week office visit Setting: two private pediatric practices in Tennessee Sample: N=369 Parent at least 18 years old with an infant less than 30 days old	RCT Intervention: The intervention had three components: 8-minute video developed by a vaccine research team, an educational handout regarding common vaccine concerns, and a handout with instructions on how to find information on the Internet The control group received no intervention	An IRB approved the study and all subjects signed an informed consent form.	Parents in the intervention group demonstrated improved attitudes about vaccination when compared with the control group parents (p=0.049). No differences were observed between the two groups with respect to receiving vaccinations on time within the child's first 12 weeks of life.	Parental attitude surveys were given in person, thus increasing the change of social desirability bias Since the setting was from a single geographic location, generalizability may be limited	An educational intervention consisting of a video and educational handout can increase positive parental attitudes towards vaccination, but has no effect on actual vaccination rates.