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Barriers to Immunizations

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Introduction

Prior to vaccinations, thousands of children died each year due to diseases such as Diphtheria, Haemophilus Influenzae Type B (Hib), Measles, and Pertussis to name a few. These diseases that once devastated the United States are now controlled with life saving vaccines. Although the United States as a whole has a very high compliance rate in regards to pediatric vaccinations, many families still refuse to receive vaccinations.

Diseases such as measles and mumps, once virtually eradicated from the United States, are now rising again. The Center for Disease Control reported in 2009 that there were 6,854 cases of mumps in the northeastern United States (Whyte, 2011). People who are exempt from immunizations are up to 35 times more likely to contract measles and up to 6 times more likely to contract pertussis compared to those who have been vaccinated (Gust, 2009). From 1994 to 2001, non-medical exemptions from vaccinations have grown 6% each year. As of 2010, only West Virginia and Mississippi do not allow for non-medical exemption from vaccinations unless the child is home schooled (Street, 2011). Of the three main vaccine preventable diseases (measles, mumps, and pertussis) that are currently on the increase, pertussis has the highest correlation of recurrence with non-vaccinated individuals as compared to those that have been vaccinated (Yang, 2014).

Influenza, a respiratory tract infection seen commonly in children, is another preventable disease that continues to cause mortalities each year. Influenza affects 84 out of 100,000 children under the age of 5, and leads to more hospitalizations for this age group than any other illness. Chen (2011) reports that the national cost of treatment for influenza is an average of \$76.5 million annually. Due to these astonishing facts, the administration of the flu vaccine is not only

crucial toward the healthcare cost of our nation, but for mortality prevention as well. The current recommendation from the American Academy of Pediatrics (AAP) is to administer the vaccination once a year starting in the fall for ages 6 months to 18 years (Chen, 2011).

Vaccinations have been controlling disease outbreaks for decades by essentially eradicating many vaccine-preventable diseases. Within the current recommended vaccination schedule, 14 diseases are addressed for children by age two. Only 76% of children are up to date on vaccinations in the United States (CDC 2011). Healthy People 2020 has a goal of 80% or higher for vaccination compliance, and a goal of 90% in order to halt the spread of organisms that cause these diseases (Connors, 2012). Although there are a multitude of reasons why parents find to deny their children the recommended immunizations, the rationale for this literature review is to look at these obstacles and find positive ways nurse practitioners can affect parent decision-making process through education and instruction. This literature review will discuss how nurse practitioners can increase the immunization rates of children in order to prevent the reoccurrence of avoidable diseases.

Table 1 Conceptual and operational definitions

	Conceptual Definition	Operational Definition
Barriers to Immunizations	Circumstance or obstacle that keeps people or things apart or prevents communication or progress (Oxford, 2014)	Demographic information (age, sex, marital status, income), belief system, social media/internet
Adverse Events	“Any noxious and unintended response to a drug that occurs at doses normally used in humans for the prophylaxis, diagnosis or therapy of disease” (Aagaard, 2011)	Reaction to immunization, developmental delay/congenital changes thought to be associated with receiving an immunization. Ex. Autism, diabetes, asthma

Herd Immunity	General immunity to a pathogen in a population based on the acquired immunity to it by a high proportion of members over time (Oxford, 2014).	Children within the community receiving none or less than what is required by national standards of immunizations.
Alternative Schedule	A choice limited to one of two or more possibilities, as of things, propositions, or courses of action, the selection of which precludes any other possibility (Oxford, 2014)	A schedule of receiving vaccination that is other than that of the CDC vaccination schedule.
Cocooning	“Envelop or surround in a protective or comforting way” (Oxford, 2014)	Providing vaccination to anyone who comes into close contact with the infant within his first 12 months of life

Theoretical Framework

The theoretical framework chosen for this literature review is the Health Belief Model. This model was created by social psychologists Hochbaum, Rosenstock, and Kegels in the 1950's with the idea that the way a person regards his or her own personal health is in response to personal beliefs and perception about disease and ways to prevent them. The model looks at four main ideas: perceived seriousness, perceived susceptibility, perceived benefits, and perceived barriers (Chen, 2011). These four ideas create the foundation caregivers use in the decision to immunize their children.

First, parents have to agree that the prevention of disease is a serious enough problem to address with action. Parents then have to look into the susceptibility of their child encountering the disease. In receiving the vaccination, a decision will then have to be made on the basis of the benefits outweighing the risks or barriers.

The majority of today's parents/caregivers have never witnessed the devastation these diseases once had on the United States prior to vaccination access. With a decreased level of exposure to the complications of these communicable diseases, the healthcare community now faces a new challenge to educate the public of the seriousness of these diseases.

In addition to these four main concepts, the health belief model looks at the "cues to action" in addressing health behaviors. These "cues" are factors such as deaths in the media, publicized outbreaks, or social media information that can lead or persuade people to make certain health decisions. Examining the role that the health care provider has in the influence of immunizations is a main concept in this review.

Methodology

When researching information for barriers to childhood immunizations, access was obtained from the Southern Adventist University McKee Library online. Data was obtained between June 2014 and August 2014. The Cumulative Index of Nursing and Allied Health Literature (CINAHL) database was used within the McKee library with an advanced search setting limiting the data to sources that were published from 2009 to 2014, actual research articles, and contained specific terms. The search terms were then limited to the following: Key term of "childhood immunizations," and secondary terms of "herd immunity," "barriers to immunizing," "alternative scheduling," "MMR," "Flu Vaccine," "TDap," "adverse events," "provider views," and "alternative schedules."

Literature Review

Recurrence of Diseases

Whooping cough is just one vaccine-preventable disease that is showing a true resurgence. More than 600 cases of pertussis were reported in Washington in 2010, along with 2100 in California, leading to the death of 10 infants (Running & Fitnews, 2011). Although 20 million cases of whooping cough occur around the world each year, places such as the United States have experienced very few cases until recently. When the original vaccine became available in the 1940's, the occurrence of the disease dropped considerably. Since then, the number of cases has continued to rise. The World Health Organization reports 1730 cases in 1980, to 12,213 cases in 2008. The CDC (2010) gives its current recommendation for prevention of this disease with a five dose childhood series of DTaP, protecting against Diphtheria, Tetanus, and Pertussis (Olyarchuk, 2012).

Measles is another example of a vaccine preventable disease that is currently showing up in communities for unvaccinated children. In 2014 alone, the CDC has reported 603 cases of the measles in the United States, which is by far the highest number since the disease was reported as eliminated in the year 2000. Of these cases, the vast majority of the people were not vaccinated against the disease. According to the Center for Disease Control (2014), many of these cases are being brought from the Philippines, a very poorly immunized area. Not only does non-immunization affect the health of the individual, but all of the people the individual contacts as well.

Barriers to Immunizations

Why is there so much resistance from parents in vaccinating their children? There are several barriers that will be discussed in this section when addressing vaccinations. These

barriers will include the influences of Dr. Andrew Wakefield, the idea of “association with causation,” alternative medicine including alternative immunization schedules, social media, socio-economic status, and influence of other providers.

Link with Autism

Andrew Wakefield (1998) Lancet Article linked the MMR vaccine to autism. Millions of dollars were spent in Great Britain and the United States with consensus from scientists and the courts that overwhelmingly disproved this hypothesis with any connection between vaccines and autism. Even so, 16 years later, doubts and concerns of vaccinations have continued to rise (Kirkland, 2012). Although the study has now been retracted based on false methodologies, the publication of that false research has still altered the overall view of vaccinations.

Since the hypothesis of the association with autism was made, several groups have formed to advocate against vaccinations. It is worthy to note that it is parents that have worked to establish all of the groups formed within the past decade advocating for vaccine refusal. Most of these parents also have a link they have associated between vaccination and medical diagnosis within their own children. Through these activist parents and allied professionals with strong views linking vaccines to disabilities, vaccination fears have remained heightened, even with extensive researching suggesting otherwise (Kirkland, 2012).

Smith (2010) addresses autism as being the “hot topic” and its correlation with increased noncompliance with vaccines over the past decade. Within the first two years of life, when most vaccines are administered, parents begin to correlate any illness a child may have to the vaccination instead of a general “sick” occurrence. Because autism is so much more prevalent in this generation and infectious diseases are not, most parents are more fearful of their children

being autistic than of infectious diseases. Unfortunately, autism is typically diagnosed within the second year of life, when most vaccines are used, demonstrating the “association with causation” (Smith, 2010).

Alternative Scheduling

Street (2011) addresses the discussion in Dr. Bob Sear’s book “The Vaccine Book: Making the Right Decision for your child versus the research performed by Dr. Paul Offitt opposing this view. Dr. Sear’s book is a guide for parents addressing the need for an alternative vaccination schedule and the spacing of vaccines. In 2009, Dr. Paul Offitt (director of the Vaccine Education Center and Children’s Hospital Philadelphia) suggested that an alternative vaccination schedule was found to have several misrepresentations within the validation of the research. Dr. Offitt also give several research findings with the harm in delaying of vaccinations and reasons as to why the traditional schedule is still the best option (Street, 2011). The hot topic of “alternative scheduling” is yet another barrier in childhood vaccinations. Although the positive is that at least children are receiving some vaccinations, the question remains as to the consequences of exposure before vaccination. Parents believe that by spacing the vaccinations out they are helping not to “overload” the immune system. They also believe that this may be less traumatizing to the patient. While there may be some truth to these ideas, which vaccines are chosen first and how can exposure be prevented in the mean time? The problem is that the exposure cannot be prevented. Furthermore, there are no scientific findings that delaying the vaccines gives any benefit versus the traditional schedule (Smith, M. 2010).

Media

The use of the Internet is found to be another major barrier to vaccinations. Search engines such as “Google” and social media sites such as “Facebook” make access to information

limitless. The drawback is that the information is typically inaccurate with no scientific backing or reliability. A shocking 64% of Americans report using the Internet as their source for health information (Smith, M. 2010). Public figures in the media continue to influence society with compelling stories of how vaccinations have personally affected someone they know.

Celebrities and political figures such as John McCain, Don Imus, and Jennie McCarthy have all given testimonies against vaccinations and its relation to autism which have caused the public to doubt expert medical advice (Street, 2011).

Adverse Reactions

The fear of adverse events following immunization is one that plays into most parents' minds at some point or another. Aagaard and Hansen (2011) reviewed a decade of adverse events associated with immunizations. An adverse event was defined as "any noxious and unintended response to a drug that occurs at doses normally used in humans for the prophylaxis, diagnosis or therapy of disease." Within this study, Aagard and Hansen found that although some adverse events did occur, the majorities were non-serious. The most common adverse event was injection site reactions. Of the serious events, the largest majority (16%) came from nervous system reactions. This included febrile convulsions and pyrexia. In over one decade of immunizations given, two deaths occurred from the 2600 reactions reported. Voluntary reporting is a major limitation of this type of data and there is no way to confirm that the death of these two children can be strictly related to the vaccination alone (Aagard, 2011).

Alternative Medicine

Along the same line of alternative scheduling is the use of a Complimentary and Alternative Care Provider, such as a chiropractor, instead of a traditional Primary Care Provider to obtain vaccination information. Downey and Tyree (2009) found that over half of

chiropractors believe that vaccinations should never be given in children, especially those under one year of age. Furthermore, chiropractors believe that vaccinations don't actually prevent disease, and that vaccinations actually cause diseases to occur. Another key argument is that Alternative Care Providers believe the only way to obtain immunity is through actual infection, not vaccination. To examine the use of provider-based Complementary Alternative Medicine therapy and recommended pediatric vaccinations, Downey (2009) performed a study on 213,884 insurance claims between the ages of 1 year and 17 years from 2000 to 2003 covered by two insurance companies in Washington State. In review of these claims, this study suggested that parents who use naturopathic physicians or chiropractors for pediatric care were less likely to meet recommendations for vaccinations. It also suggested that interventions with CAM practitioners and parents might be needed to increase support for pediatric vaccination (Downey, 2009).

Socio-Economic Status

There are also several barriers found related to the socio-economic status of the family. In a one-month study conducted on 100 Latino moms in Southern California, several barriers were discovered related to immunizations. Issues such as lack of insurance, language barriers, and income status were the main findings as reasons for lack of immunizations. There was also a lack of available transportation for these mothers in order to take their children to the well visits. Additionally, sick visits created delays in receiving vaccinations. Of all the issues noted, the understanding of the vaccination schedule from the mother seemed to be the most substantial barrier found (Adorador, 2011).

Similarly, Uwemedimo (2012), found in a survey of 705 caregivers in an inner-city community, that communication skills, income and insurance were key factors in preventing

children from obtaining vaccines. Of the 168 children evaluated through the survey results, only 11% received the flu vaccination during the first season of surveys. Children of younger parents (categorized in this study as less than 30 years of age), low socio-economic status, lack of higher education (including high school diploma), and limited English proficiency, tended to have an overall decrease of immunization possibly due to the lack of knowledge about preventable diseases (Uwemedimo, 2012).

Hofstetter (2013) found a recurring theme looking at an urban community in Manhattan, New York from 2004-2008. This study found that the ethnicity, age, and insurance status of the individual were the key factors in the receiving of the flu vaccination. Patients of a minority, younger in age (less than 20 years of age), as well as enrolled in Medicaid were less likely to receive vaccinations (Hofstetter, 2013).

Occupational Therapist View

Street (2011) studied the Occupational Therapist's view of vaccinations. Interestingly, the survey found that the entry-level Occupational Therapist's versus the post-professional education Occupational therapists were the one's with far less accurate knowledge regarding vaccinations. The participant's realized that the more education they received, the more they realized the importance of immunizations to all children and the lack of a relationship between issues such as immunizations and autism (Street, 2011).

Overall findings of Barriers

Luthy and Calister (2010) performed a survey in Utah to determine why parents are so hesitant to immunize their children. Several recurring themes were shown. First, parents felt there was a link between autism and vaccines. Secondly, they believed that giving several

immunizations at once could cause an “immune overload.” And finally, they were fearful of adverse reactions caused by the vaccine administration (Luthy, 2010).

Solutions to the Barriers

There are several solutions to the barriers listed previously that will be discussed in this section when addressing vaccinations. These solutions will include the recommendation of useful resources, addressing the needs of high-risk populations, combination vaccines and target populations, parent/provider trust, and finally OB/GYN recommendations.

Useful Resources

Although there are numerous websites available to parents that give unreliable information to vaccines, there are just as many accurate sources of information out there. The American Academy of Pediatrics and the National Foundation for Infectious Diseases are two excellent websites with up to date information available to both parents and providers (Smith, 2010). Providing parents with a list of these useful websites may help to defer them from sites that could create potential problems.

High-Risk Populations

Addressing specifically the needs of low-income families, minorities, and younger caregivers, patterns of common barriers are seen which need to be overcome to help increase vaccination awareness. Overall, knowledge is key for any caregiver, and emphasis needs to be placed on the value of vaccines towards the prevention of deadly communicable diseases. Furthermore, when addressing the financial burden that can be placed on these parents, it is important to provide resources that can eliminate this concern. The Vaccines For Children (VFC) is a federally funded program that provides vaccines to children at no cost who qualify (CDC,

2014).

When addressing the needs of the flu vaccine, location seems to be the factor that can increase compliance. Cawley, (2010) looked at strategies of administrating the flu vaccine on site at local schools, and found that this approach could not only immunize more students, but also at a lower cost (Cawley, 2010). One study evaluated within this research showed a net savings of \$35 per child with group-based delivery of the flu vaccine (Cawley, 2010).

Combining Vaccines and Target Populations

Another solution to the issue of multiple vaccinations in one visit is to combine vaccinations. Ackerson (2012) addresses the use of the MMRV vaccine instead of the traditional MMR, which adds varicella to the same injection. These results in one less injection being given, and have actually been shown to have a slight increase overall compliance of vaccinations (p value of .2638). The small increase suggests that there are still other barriers to address when evaluating compliance with vaccines (Ackerson, 2012).

In addition to combining vaccinations, another solution is to offer vaccinations to parents early on during routine wellness visits. One vaccination of particular importance in this regard is the TDaP (Tetanus, Diphtheria, and Acellular Pertussis) vaccine. The Advisory Committee on Immunization Practices recommends using a “cocooning” approach to the prevention of pertussis. This means giving the TDaP to anyone who comes into close contact with infants within his first 12 months of life. By offering the vaccination in this atmosphere at no cost, those who may otherwise not have access to healthcare or lack insurance are now able to not only protect themselves but the ones around them. Camenga (2012), concluded that this technique alone increased the rate of TDaP administration by 69% to caregivers of children less than 12

months of age (Camenga, 2012). Of the 82 cases of pertussis deaths from 2004 to 2006, 84% were in children younger than 3 months of age (CDC, 2009).

Although cocooning is an effective method in providing protection to infants less than two months of age, there may be an even better option. According to the Advisory Committee on Immunization Practices, it is now recommended that mothers receive one dose of Tdap during the 3rd trimester of pregnancy. This type of immunity actually decreases deaths from pertussis by 49% versus 16% with the previous cocooning method. Additionally, this method is cost-saving, costing \$414,523 per year versus cocooning at \$1,172,825 per year (Terranella, 2014). Although cocooning can give additional protection, vaccination during pregnancy seems to be the most efficient and cost-saving option.

Parent/Provider Trust

Parents want to be involved in the decision making process of their children. With that, they want to hear both the positives and the negatives before coming to a decision. Glanz (2013) found in a parent survey in Colorado, that parents felt as though they received a biased opinion from the healthcare provider in regards to vaccines. They felt as though they were told there “were no risks” when they knew there were. Therefore, finding and giving objective information in regards to vaccines will help to eliminate this problem and create more trust between the provider and caregiver (Glanz, 2013).

There are many parents who have a general hesitancy when it comes to vaccine administration and their children. Williams (2013), found that overall, times spent addressing these hesitancies is what can eliminate fears and increase compliance in this area. The study performed from a survey looking at parent attitudes towards vaccines found that only 53% of

providers spent at least 10 to 19 minutes per visit addressing the needs of vaccine hesitant parents. The study concluded that with an 8-minute video and information regarding the concerns of vaccinations that the attitude towards vaccinations could improve thus increasing overall compliance (Williams, 2013). With the healthcare community trending towards a client-centered, collaborative approach between the patient and provider, patient compliance begins at the bedside making time to address concerns (Austvoll-Dahlgren, A., 2010).

OB/GYN

Overall, providers have a unique opportunity to influence parents through education and trust in giving life-saving vaccinations to their children. Although it may seem to be a job just for the primary care physician, each area of the health care community has an obligation to inform parents. One specialty area of interest is the OB/GYN. In this role, the provider has a unique opportunity to have frequent contact for almost a year of a parent's life. Studies have shown that patients trust their OB/GYN more than any other physician. Knowing this, these providers must seize this opportunity to educate parents in regards to not only vaccinations during pregnancy, but to discuss the need for childhood vaccinations once the child is born. Unfortunately, less than 20% of these providers find it part of their job to discuss this information (Link-Gelles, R., 2012). If more education is given prior to delivery, fears and resistance could decrease and ultimately increase overall vaccination rates.

Conclusion

Vaccinations are a vital part of our health and wellness and crucial for preventing many deadly diseases from occurring. Although vaccinations are known to save lives, there are still many children not receiving vaccinations based on several findings from this literature review. There are many ways we as providers in the primary care setting can help address and eliminate

these barriers. These findings emphasize the need to: 1.) Provide factual information regarding vaccines. The American Academy of Pediatrics and the National Foundation for Infectious Diseases are two excellent websites with up to date information available to both parents and providers (Smith, 2010). The Center of Disease Control also provides an excellent brochure “Parents’ Guide to Immunization” giving a short summary on each childhood vaccine preventable diseases that is easy to read. Providing parents with a list of these useful resources may help to defer them from information that could create potential problems. 2.) Provide resources to low-income families such as the VFC program, which provides free vaccinations. 3.) Finally, health care providers must stay up to date on evidenced based practice regarding vaccine safety and common misunderstandings from caregivers in order to create a positive impact on the adherence and compliance of receiving immunizations. A collaboration approach between the healthcare provider and the caregiver will help to address hesitancies, eliminate fears, and increase overall compliance with vaccinations.

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