EDUCATION REGARDNG INAPPROPITATE ANTIBIOTIC USE

by

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Capstone Paper submitted in partial fulfillment of the
requirements for the degree of

Doctor of Nursing Practice

Chatham University

April 4, 2016

4.4.16

Signature Faculty Reader Date

Signature Program Director Date

Acknowledgments

I would like to thank the RediClinic @ Rite Aid for allowing me to implement my project at the site, recruit patients and use the staff. I would like to thank the patients who agreed to participate in the project. My deepest appreciation to my preceptor Dr. Veronica Quattrini, onsite liaison Graciela Rodriguez-Santos, and preceptor Dr. Kaysan Johnson. I would also like to thank Compliance Director Alyssa Parrish for helping me get permission to use practice site.

I want to thank my professor Dr. Brad Sherrod, who has guided me through this doctoral project since the very first course at Chatham University. In addition, to all my DNP classmates for their support and phone calls, my deepest appreciation. I also want to thank all my family and friends who have supported and encouraged me through these years.

Last to my husband, Bobby Bennett, Jr., thank you for encouraging me and being there for me through the toughest times while pursuing my doctoral degree. Thanks for all your love and patience.

Dedication

I would like to dedicate my Capstone Project to my mom Inell Collins Person who is deceased but lives on in my heart. My mom has always been an inspiration to me. She instilled in me hard work and independence. I wish she could have been here to see me graduate, she always taught me to never give up and to do my best in everything I do. Love you, Mom.

Abstract

Antibiotics are one of the most commonly prescribed drugs in the United States. The use of antibiotics is the main driver in creating selective pressure for the emergence of antibiotic-resistant bacteria. Despite a high probability of viral etiology, acute respiratory tract infections (ARTI's), such as bronchitis, pharyngitis and sinusitis, account for 75% of all antibiotics prescribed by office-based providers. In the last decade, bacteria resistance has increased and many bacterial infections are becoming resistant to commonly prescribed antibiotics. In retail clinics, it is exceedingly common for patients to ask for an antibiotic for a viral illness. Patients lack the knowledge about antibiotic resistance when receiving antibiotics for viral illnesses. The clinical problem of inappropriate antibiotic use for viral upper respiratory infections (URIs) in retail clinics is nationwide, which has been addressed by the Center for Disease Control and Prevention (CDC), noting the use of antibiotics is an important factor leading to antibiotic resistance in the world. Based on a literature review, an educational intervention was designed to increase patient knowledge of inappropriate antibiotic use for viral URIs and improve patient attitudes concerning not obtaining antibiotics for viral infections. The educational intervention consisted of a Power Point presentation with information from the CDC about antibiotic use and viral URI's. The participants that viewed the educational presentation had a mean 27.5 point increase in knowledge and a mean 11.5 point increase in attitude. The data analysis revealed the project outcomes were achieved.

Key words: antibiotics; antibiotic resistance; viral upper respiratory infections; patient knowledge; patient attitudes; retail health clinics

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Chapter One: Overview of the Problem of Interest

Viral illnesses being treated with antibiotics are very common. Patients go to physician offices, clinics, or hospitals looking for antibiotics for viral illnesses such as Upper Respiratory Infections (URI [Common Cold]), Bronchitis, or Viral Pharyngitis. Using antibiotics for a viral illness does not cure the virus, but it does increase the chance of developing antibiotic resistance. Antibiotics are one of the most commonly prescribed drugs in the United States. The use of antibiotics is the main driver in creating selective pressure for the emergence of antibiotic-resistant bacteria (Lee et al., 2014). Despite a high probability of viral etiology, acute respiratory tract infections (ARTI's), such as bronchitis, pharyngitis and sinusitis, account for 75% of all antibiotics prescribed by office-based providers (Lee et al., 2014).

In the last decade, bacteria resistance has increased and many bacterial infections are becoming resistant to commonly prescribed antibiotics (Center for Disease Control and Prevention [CDC], 2014). In retail clinics, it is very common for patients to ask for an antibiotic for a viral illness. Patients lack the knowledge about antibiotic resistance when receiving antibiotics for viral illnesses. When patients are told that, their viral illness does not warrant an antibiotic, patients sometimes get angry and feel like they came to the doctor for no reason. Lack of knowledge of viral illnesses and antibiotic resistance is a known problem in retail clinics. Price, MacKenzie, Metlay, Camargo, and Gonzales (2011) states patients' desire for antibiotics may be caused by misconceptions about viral illnesses and their treatments. These misconceptions are compounded by clinicians' limited ability to educate patients about appropriate antibiotic use and acute respiratory illnesses during office visits along with time constraints and other demands (Price et al., 2011). The purpose of this chapter is to introduce an

evidence-based practice (EBP) change project that focuses on providing education about appropriate antibiotic use for viral URI's and antibiotic resistance.

Background Information

Antibiotic resistance has been called one of the world's most pressing public health problems. Infections due to antibiotic-resistant organisms are associated with loss of productivity, poorer health outcomes and greater health care costs. Antibiotic resistance is estimated to cost $60 billion annually in the United States (Lee et al., 2014).

With patients', lack the knowledge about antibiotic use and viral illnesses the risk of antibiotic resistance could be reduced if patients understood that antibiotics do not cure viruses. Madle, Kostkova, Mani-Saada, Weinberg, and Williams (2004), states educating and informing the public is essential for reducing the further development and spread of antibiotic resistance. In 1992, antimicrobial agents were the second most common medications prescribed by office-based physicians in the United States, which accounted for 12% to 14% of all drugs prescribed (Cantrell, Young, & Martin, 2002). The CDC (2014), states that $1.4 billion is spent annually on unnecessary adult URI antibiotic prescriptions. In 1992, two of the five most common conditions, which the antibiotics were prescribed for, were URI's and acute bronchitis (Cantrell et al., 2002). These conditions accounted for 12 million prescriptions or 21% of all antibiotics prescribed (Cantrell et al., 2002). There is documented evidence that antibiotics have little or no effect for those respiratory illnesses (Cantrell et al., 2002). When a person takes antibiotics, sensitive bacteria are killed, but resistant germs may grow and multiply (CDC, 2014). Repeated use of antibiotics is the main cause of increased drug-resistant bacteria (CDC, 2014).

Within retail clinics, the lack of knowledge about viral illness and drug resistance bacteria should be addressed. If patients are well educated, the chance of developing antibiotic

resistance bacteria could decrease (CDC, 2014). Antibiotic resistance can cause significant danger and suffering for people who have common infections that can be treated with antibiotics. When antibiotics no longer work, the consequences could be longer lasting illnesses, more doctor visits, and extended hospital stays (CDC, 2014).

Significance of Clinical Problem

Antibiotic resistance is becoming one of the most serious health threats in the United States (CDC, 2013). The CDC (2013), states that infections from resistant bacteria are too common and that pathogens are even more resistant to multiple classes of antibiotics. The loss of antibiotics impairs provider's ability to fight infectious diseases and manage infectious complications. When first line and second line antibiotics are limited by resistance, health care providers will be forced to use antibiotics that may be more toxic to the patient, more expensive, and less effective (CDC, 2013). The CDC (2013) has estimated in the United States that more than two million people are sickened every year with antibiotic resistant infections with at least 23,000 dying as a result. In order to correct this problem, patients must be educated about appropriate antibiotic use for viral URIs and antibiotic resistance (CDC, 2013).

The CDC (2013) states that there are four core actions to prevent this problem. These actions are preventing infections and spread of resistance; tracking data of antibiotic resistant infections; improving antibiotic prescribing; and developing new drugs and tests. Preventing antibiotic resistance in health care settings will protect patient lives and preserve health. The World Health Organization (WHO; 2010), states resistance can be contained through careful and appropriate antibiotic use. Integrated monitoring of antibiotic consumption and resistance, prescriber and consumer education that is paid for and coordinated by the government and regulation of use in communities and hospitals; have shown it is possible to contain antimicrobial

resistance (WHO, 2010). When preventing antibiotic resistance in health care settings, healthcare facilities, systems, insurers and patients will save dollars that would have been spent on care that is more complex and medications needed for antibiotic resistant infections (CDC, 2013). Excessive use of antibiotics and increase in drug resistance results in the use of more toxic and more expensive treatment alternatives (Cantrell et al., 2002). Patients are more likely to require hospitalization and have longer hospital stays, and more likely to die when infected with drug-resistant organisms (Cantrell et al., 2002). The clinical problem guiding this EBP change project is the lack of knowledge about appropriate antibiotic use for viral URIs and prevention of bacteria resistance in retail clinics.

Question Guiding Inquiry (PICO)

EBP is the use of current evidence to make decisions about patient care. EBPs take data from multiple studies and combines it with practitioner expertise as well as patient values (Melnyk & Fineout-Overholt, 2011). The EBP approach allows healthcare providers to obtain the best evidence to answer clinical questions and translate that evidence into clinical practice to improve patient care and outcomes (Melnyk & Fineout-Overholt, 2011). In EBP, clinical questions are asked in PICO format. PICO stands for: P – patient population; I – Intervention or issue of interest; C – Comparison (may or may not be included in question); and O – outcome. A well-built clinical question drives the steps to the EBP process (Melnyk & Fineout-Overholt, 2011). The PICO question guiding this topic inquiry asked, *"In a retail clinic where ambulatory adults present with viral symptoms, does providing education improve patient knowledge and attitude about appropriate antibiotic use for viral upper respiratory infections?"*

Population. The targeted population for the EBP change were ambulatory adults presenting with viral URI symptoms at retail clinics. Individuals were 18 years of age or older of

both genders including all ethnicities. Individuals presented with signs and symptoms of a URI, such as low-grade fever, headache, sore throat, muscle aches, fatigue and cough.

Intervention. The intervention selected through literature appraisal was providing education on appropriate antibiotic use for viral illnesses and bacteria resistance. Cantrell et al. (2002) stated that physicians need to spend more time educating patients who want antibiotics. Antibiotic prescribing for URI's is unacceptably high and the rate of inappropriate antibiotic prescribing results in wasted economic resources and exacerbates the problem of antibiotic resistance (Cantrell et al., 2002). Taking the time to explain to patients about antibiotics, will help patients understand the antibiotics they take, as well as aiding in combating resistance (Aziz, 2013).

Comparison. There is no comparison group. However, participant knowledge of appropriate antibiotic use for viral URIs was compared pre to post educational intervention to assess for change. Participant attitude related to appropriate antibiotic use for viral URIs was also compared pre to post intervention.

Outcomes. The two desired outcomes for this EBP change project were: a) An increase in knowledge about appropriate antibiotic use regarding viral URI's; and b) An improvement of attitude regarding the use of antibiotics for viral URI's. The pre to post educational intervention educated the participant about appropriate antibiotic use for viral URIs. The goal of the EBP change project was to improve the knowledge and attitude of the participant, which could impact antibiotic resistance over time. Project evaluation is viewed as the final step in implementation (Harris, Roussel, Walters, & Dearman, 2011).

Summary

Antibiotic resistance is a universal problem that needs to be tackled by a wide variety of strategies and stakeholders. Provider approach to tackling bacterial resistance to antibiotic agents must therefore also be dynamic (WHO, 2012). The following strategies are essential in healthcare if antibiotic resistance is to be recognized and controlled. Those strategies are: limit antibiotic prescribing; better sampling and quicker laboratory testing; auditing antibiotic prescribing; institute antibiotic policies; involve antibiotic pharmacists and committees; infection prevention and control; staff awareness and education; patient education; national initiatives; innovations; surveillance and research (Aziz, 2013). Patients should be made aware that most common viral and bacterial infections, such as coughs, throat and ear infections, and stomach upsets, are self-limiting in healthy people, who will generally get better with no treatment at all (Aziz, 2013).

In order to change clinical practice, EBP is required. With the growing use of retail clinics, education on appropriate use of antibiotics is important. The growing health concern of antibiotic resistance is serious. Viral illnesses are commonly treated with antibiotics due to patients expecting a “cure all” for their sicknesses. This repeated use of antibiotics has increased the risk of antibiotic resistance and the ability to fight infections will become more difficult. Increasing knowledge about appropriate antibiotic use through education can most likely aid to decrease resistance risk. Patients who understand the risks involved with repetitive antibiotic use may change their attitudes about not receiving antibiotics for viral infections. There are documented misconceptions about effectiveness of antibiotics for viral illness, resulting in self-medication and unnecessary medical visits (Ong et al., 2007). Physicians may also contribute to these misconceptions by prescribing antibiotics and creating expectations for patients in the

future (Ong et al., 2007). Educational Interventions for patients have demonstrated some ability to reduce unnecessary antibiotic use (Ong et al., 2007). After the clinical problem was defined, evidence was appraised to ascertain an appropriate solution.

Chapter Two: Review of the Literature

The clinical problem of inappropriate antibiotic use for viral upper respiratory infections (URIs) in retail clinics is nationwide, which has been addressed by the Center for Disease Control and Prevention (CDC; 2013) noting the use of antibiotics is an important factor leading to antibiotic resistance in the world.

A literature review was conducted to provide information about existing evidence to address this clinical problem. This integrative review presents: research related to the treatment of URIs; appropriate antibiotic use for viral URIs; and patient's knowledge and attitudes of antibiotics for viral URIs. The purpose of this chapter is to present critiqued evidence with the goal of establishing the best intervention to improve patient knowledge of and attitude toward inappropriate antibiotic use for viral URIs and antibiotic resistance.

Methodology

Sampling strategies. A literature search was conducted from the Jennie King Mellon Library through Chatham University. The following databases were used for a comprehensive electronic literature search: Cumulative Index to Nursing and Allied Health Literature (CINAHL); PubMed (which includes MEDLINE); and Google Scholar. Keywords used in the search were: antibiotics; viral illnesses; upper respiratory infections; lack of knowledge of antibiotics and viral illnesses; antibiotic resistance; upper respiratory illness in the United States; knowledge and attitudes of patients about antibiotic resistance; and viral upper respiratory infections. The Boolean Operator "AND" was utilized to combine the key words in multiple combinations to increase evidence yield. The search was limited to 19 years (1995-2014). Search limits were: English only; full text; academic journals; free full text; nursing journals; clinical journals; include related terms; and MEDLINE. The literature that was selected for

evidence was assigned a level according to the Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions by Melnyk and Fineout-Overholt (2011). The levels of evidence are:

> "Level I - systematic review or meta-analysis of randomized control trials (RCT's); Level II - evidence obtained from RCT's; Level III - evidence from controlled trials without randomization; Level IV - evidence from case-controlled and cohort studies; Level V- evidence from systematic reviews of descriptive and qualitative studies; Level VI - evidence from single descriptive or qualitative studies and; Level VII - evidence from opinion of authorities or reports of expert committees" (Melnyk & Fineout-Overholt, 2011, p.12).

Data evaluation. The literature selected for the EBP change project was directly related to the clinical question and educational intervention. Studies were selected based on being related to the clinical problem, population, supported intervention of education, and improved patient outcomes. In addition, evidence supported the need of education, and provided background and significance to the project. All evidence levels were included for review, but only studies with levels II, IV, and VII were selected based on inclusion criteria. Appendix A shows the critical appraisals of studies selected for inclusion within this integrative review of literature.

Literature Review Findings

Literature selected supported the intervention of pre to post education to increase knowledge and attitudes of antibiotics for viral illnesses. In a healthcare strategies article by Aziz (2013), issues related to antibiotic resistance were discussed. A point prevalence survey of antibiotic prescriptions at Antrum Area Hospital in Northern Ireland in 2008 showed how

monitoring antibiotic prescribing supported optimal antibiotic use and improved performance by identifying and adopting best practice. Auditing antibiotic prescribing in clinical practice helps to highlight inappropriate antibiotic use. Aziz (2013) noted strategies to decrease antibiotic resistance as limiting antibiotic prescribing, better sampling and quicker laboratory testing, auditing antibiotic prescribing, antibiotic pharmacies reviewing prescription sheets and limiting antibiotic prescribing, infection prevention and control, staff awareness and education, patient education, national initiatives, innovations, surveillance, and research (Aziz, 2013). Aziz (2013) stated if patients are given leaflets with issues related to antibiotic resistance, and time is taken to explain to patients about antibiotics, patients will understand the antibiotics they take, which will aid in combating resistance.

Madle, Kostkova, Mani-Saada, Weinberg, and Williams (2004) aimed to evaluate the effect of a health education website on the user's knowledge and attitudes of antibiotic prescribing. This literature supports the intervention of education regarding antibiotics and viral illnesses. The intervention used in the study was the National electronic Library of Infection website (NeLI). The aim of the site was to inform the public of current evidence-based guidelines on antimicrobial prescribing. In order to evaluate the impact of the health information videos on the knowledge and attitudes of the public, a pre and post-use questionnaire was used. Madle et al. used an opportunistic sample of participants who were asked to complete a short electronic questionnaire before using the website. The first part of the questionnaire was completed by 227 participants prior to using the site and both questionnaires were completed by 177, which comprised of the study population. The population were between the ages of 25 and 44, and 49% had undergraduate degrees or higher level. The pre-use questionnaire contained seven true/false statements about antimicrobial resistance and six statements about the use of

antibiotics in acute otitis media (AOM) that were ranked on a Likert scale. The post-use questionnaire repeated the questions and asked about the usability of the website. The aim of the two identical sets of questionnaires were to test for change in knowledge about antibiotics and AOM, to investigate the relationship between perceived knowledge gain and actual gain, to test for change in attitudes to the information on the site and to antibiotic prescribing, and to investigate the difference between knowledge and attitudes between health professionals and non-health professional. Following the study, user's knowledge increased and expectations of receiving an antibiotic were reduced. There were differences in the knowledge of health professionals compared to non-health professionals before using the site and health professionals were less likely to expect antibiotics for AOM both before and after using the site. This study provided evidence that health information websites have the potential to influence public opinions (Madle et al., 2004).

A multicenter, prospective, observational cohort study by Ong et al., (2007) examined antibiotic prescribing practices of physicians for emergency department (ED) patients and the effects of those practices on patient satisfaction. There were 875 patients approached to complete the study, but due to exclusions of incomplete pre-visit interviews and having bacterial infections, data was retrieved from 272 patients. These patients had a single diagnosis of either bronchitis or viral URIs. The median age was 33 years, 10 patients were older than 65 years and 54 were younger than 18 years. Patients were interviewed twice during the ED visit and received a follow up telephone interview two weeks later. Physicians were interviewed right after patient encounters. Surveys were completed by patients and treating physicians to assess some of the clinical and nonclinical factors associated with the decision to prescribe antibiotics, such as patients 'expectations. Patient satisfaction was contributed to patient education and waiting

times. The literature discussed that the inappropriate antibiotic use by physicians has consequences of drug resistance. Educational interventions towards patients showed a reduction in unnecessary antibiotic use. The conclusion of this study noted that patient satisfaction was high in association with patients' beliefs that they had a better understanding of their illness (Ong et al., 2007).

A RCT by Price, MacKenzie, Metlay, Camargo, and Gonzales (2011) examined patient responses to an interactive computerized education module to reduce unnecessary antibiotic prescribing in the ED setting. The data examined was to determine whether the module improved self-reported knowledge about appropriate antibiotic use for acute respiratory infections (ARI's) and whether self-reports of improved knowledge were related to a decrease in desire for antibiotics at that visit. Kiosks with the interactive computerized education module were in ED waiting rooms, and patients with ARI symptoms were directed to the kiosk for completion. Patients with ARI symptoms that were 18 years and older initiated the kiosk module, which included 2027 patients. Of those patients, 686 completed the module and was the focus of this study. Patients were asked whether they thought antibiotics would relieve their symptoms and were asked on a scale of 1-10 how much they wanted antibiotics. The module contained three questions about appropriate antibiotic use then followed by video segments. After the segments, patients were asked again to rate how much they wanted antibiotics on a scale of 1-10. After patients completed the module, half of the patients seeking care for ARI's reported a decrease in desire for antibiotics. There was an increase in proportion of patients who reported low desire for antibiotics pre- and post-module and concurrent decrease in proportion of patients with a baseline desire for antibiotics pre- and post-module, which shows a change in attitude towards receiving antibiotics within this population. The findings from this study support

the role of a computerized interactive education to improve patient knowledge and attitudes regarding antibiotics for ARI' s as a part of the effort to improve healthcare quality (Price et al., 2011).

Rodis, Green, Cook, and Pedersen (2004) aimed to assess the effect of a pharmacist-initiated educational intervention on patient knowledge about antibiotic resistance and appropriate antibiotic use in adult patients with an upper respiratory tract infection (URTI). The second objective of this study was to determine patient satisfaction with pharmacist intervention (Rodis et al., 2004). The setting of this study was a multidisciplinary urgent care clinic for adult patients insured with The Ohio State University Managed Health Care System (OSUMHCS). Adult patients with acute URTI symptoms were asked to participate in the study. The patients were 18 years of age or older and could speak and read English. If a patient identified one or combination of URTI symptom(s) (e.g., cough, earache, sinus problems, sore throat), the patient was offered a pre-intervention survey. The pre-intervention survey was completed by 130 patients and 46 of those patients completed and returned the post-intervention survey. The pre-intervention survey assessed two main indicators: 1) patient understanding of antibiotic resistance; and 2) patient knowledge of the appropriate antibiotics (Rodis et al., 2004). After the patient was checked in to a treatment room and before they were seen by a physician, a pharmacist provided an educational intervention. Two weeks after the intervention a post-intervention survey was sent by mail to the participants. The post-intervention survey reassessed patient knowledge about antibiotic resistance and appropriate antibiotic use and was embedded with a validated tool used to measure patient satisfaction with education intervention. The educational intervention improved patient understanding of antibiotic resistance and improved patient understanding about appropriate indications for prescribing antibiotic therapy. Patients

were also satisfied with the educational intervention about antibiotic resistance (Rodis et al., 2004).

A RCT by Taylor, Kwan-Gett, and McMahon (2003) examined the effectiveness of educational materials in improving the attitudes of parents of young children about the judicious use of antibiotics. This study was conducted in the office of practicing pediatricians. The Puget Sound Pediatric Research Network (PSPRN) conducted the study. Eight PSPRN practices, including seven private offices and one inner-city pediatric clinic volunteered to participate (Taylor et al., 2003). Parents of children who were younger than 24 months and being seen in the office of the participating practice were eligible for the study. A total of 500 parent-child dyads were enrolled in the study and at the time of enrollment, the parents completed a questionnaire that included demographic items. The questionnaire included nine statements about appropriate antibiotic usage and seven statements about injury prevention in your children. After each statement, the parents would indicate their level of agreement on a six point Likert scale with possible responses ranging from “completely agree” to “completely disagree”. After completing the questionnaire, the parents were randomized to receive educational materials about judicious use of antibiotics (antibiotic education, intervention group) or injury prevention (injury prevention, or control group). Another copy of the educational materials was mailed to the parents who were randomized for the intervention group six weeks after enrollment. This mailing included a second follow up questionnaire for the parents to complete and return. Study results suggested a simple educational intervention could significantly alter parental attitudes regarding use of antibiotics in children. The intervention was more successful in modifying parental beliefs about the need for antibiotics for specific conditions in their children

than in changing attitudes about more general or theoretical issues related to overuse of antibiotics (Taylor et al., 2003).

Limitations of Literature Review Process

Literature related to antibiotics and viral illnesses was found mostly in nursing journals. Literature that was directly related to education of antibiotics and antibiotic resistance was limited. Most of the literature was RCTs and opportunistic samples. A lack of studies with evidence levels V, VI, and VII were apparent. The majority of the studies were level II, III, and IV with positive results regarding antibiotic and viral illness education and the reduction of antibiotic resistance. Those studies that had cross sectional and retrospective analysis did not directly relate to the intervention but provided background and significance of antibiotic resistance. Another limitation was that some of the studies were foreign and did not directly related to current U.S. population.

Discussion

Conclusion of findings. The lack of knowledge of antibiotics for viral illnesses is evident. There is a need to educate patients about appropriate antibiotic use and the risk of antibiotic resistance. Research supports this need of educational interventions to improve patient knowledge and attitudes of appropriate antibiotic use for viral illnesses (Price et al., 2011). In order to change clinical practice, EBP change is needed. In retail clinics, education on appropriate use of antibiotics is important due to the growing health concern of antibiotic resistance seriousness. Viral illnesses are commonly treated with antibiotics due to patients expecting a “cure all” for their sicknesses. This repeated use of antibiotics has increased the risk of antibiotic resistance, and the ability to fight infections will become more difficult. There will be more resistance to common antibiotics, and it will be harder for patients to fight off diseases.

Increasing knowledge about appropriate antibiotic use through education will most likely aid to decrease resistance risk. Patients who understand the risks involved with repetitive antibiotic use may change their attitudes about not receiving antibiotics for viral infections. There are documented misconceptions about the effectiveness of antibiotics for viral illness, resulting in self-medication and unnecessary medical visits (Ong et al., 2007). Physicians may also contribute to these misconceptions by prescribing antibiotics and creating expectations for patients in the future (Ong et al., 2007). Educational interventions for patients have demonstrated some ability to reduce unnecessary antibiotic use (Aziz, 2013; Madle et al., 2004; Ong et al., 2007; Price et al., 2011).

Advantages and disadvantages of findings. Advantages from the literature are the evidence-based educational interventions. Computerized education modules on kiosks improved knowledge and reduced desire of antibiotics for ARI's (Price et al., 2011). Health information websites increased user's knowledge and decreased expectations of receiving antibiotics for viral illnesses. These interventions decreased the need of antibiotics for viral illness and reduced the incidence of antibiotic resistance (Madle et al., 2004). When the patients' knowledge increased, the need of antibiotics were reduced, and the attitudes about appropriate antibiotics were changed. Educating patients about antibiotics help aid in combating resistance (Aziz, 2013). Simple educational interventions such as brochures, augmented with brief discussion and/or videotape message can alter attitudes regarding antibiotics (Taylor et al., 2003). There is improvement of patient understanding about appropriate antibiotic therapy and antibiotic resistance after an educational dialogue (Rodis et al., 2004).

Disadvantages of the literature evidence are the lack of systematic reviews on the topic. Only immediate effects on knowledge and attitudes were noted, as no follow up studies were

found in the literature (Madle et al., 2004). In several studies, the surveys utilized were not tested for reliability and validity, which could affect participation results. Personal health information was not collected in some studies, which would allow a comparison of who did or did not complete the educational intervention (Price et al., 2011). Another disadvantage is when participants do not complete the post-intervention surveys. This can create bias, patients who felt they learned something might be the only ones to return the surveys (Rodis et al., 2004).

Utilization of findings in practice. In the last decade, bacteria resistance has increased and many bacterial infections are becoming resistant to commonly prescribed antibiotics (CDC, 2014). In retail clinics, it is very common for patients to ask for an antibiotic for viral illnesses. Patients lack the education about antibiotic resistance when receiving antibiotics for viral illnesses. When patients are told that their viral illness does not warrant an antibiotic, they sometimes get angry and feel like they came to the doctor for no reason. Educational interventions about appropriate antibiotic use for viral URIs in retail clinics can improve consumer knowledge and potentially assist in the decrease incidences of antibiotic resistance. An educational intervention can improve patients' knowledge and attitudes of appropriate antibiotic use, which will improve patients' outcomes, healthcare costs, and possible antibiotic resistant infections.

Summary

The need of education about appropriate antibiotic use is evident in the retail clinic setting. An EBP change project was developed to address the lack of knowledge about appropriate antibiotic use for viral URIs and prevention of bacteria resistance in retail clinics. An integrative review of literature revealed the identification of patients with viral URIs wanting antibiotics for symptoms and showing that with education, a decrease in the need of antibiotics

are seen which can aid in the prevention of antibiotic resistance. Antibiotic resistance is becoming increasingly evident, and it is important to address this clinical problem.

Chapter Three: Theory and Concept Model for Evidence-based Practice

The clinical problem identified in the evidence-base practice (EBP) change project was the lack of knowledge about appropriate antibiotic use for viral upper respiratory infections (URIs) and bacteria resistance in retail clinics. If patients are educated properly about their disease processes, they will have a better understanding of treatment recommendations, which would help decrease antibiotic resistance. The concept-theory-empirical indicator (C-T-E) structure is related to this practice change project and stands for: C- education, T- The Health Belief Model, and E - a pre to post educational questionnaire for measurement. This C-T-E structure helped guide this EBP change. The purpose of this chapter is to discuss the concept analysis, theoretical framework and the conceptual model that guided the EBP change project.

Concept Analysis

The operational definition of education according to Merriam-Webster (2014) is the action or process of teaching someone, especially in school, college, or university. Education is knowledge, skill, and understanding that you get from attending school and the field of study that deals mainly with methods of teaching. In nursing, education is used when teaching a patient about a health issue or concern.

The concept of education can be defined in many aspects. Education could mean learning or being trained in a specific field. Education could mean knowing a certain amount of knowledge, like earning, a degree or getting certified training. Education could also mean giving out information, or it could even be equated to success. In relation to the clinical problem of a lack of knowledge of viral illnesses and antibiotic use, education can be used to decrease antibiotic resistance through public awareness.

Theoretical Framework

The nursing theory that has guided this EBP change was the Health Belief Model (HBM). The HBM is a theory of health behavior that was developed by a group of United States Health Service social psychologists in the 1950's who wanted to explain why so few people were participating in programs to prevent and detect disease (HBM, 2014). The HBM addresses problem behaviors that evoke health concerns. This relates to the capstone project because patients look for antibiotics for viral illnesses, which is a problem behavior that can evoke the concern of antibiotic resistance (HBM, 2014). Janz and Becker (1984) stated that according to the HBM, behavior depends on two variables: the value placed by an individual on a particular goal and the individual's estimate of the likelihood that a given action will achieve the goal. The HBM provides a way to understand and predict a client's behavior in relation to their health and how they will comply with health care therapies. The HBM proposes that a person's health related behavior is depended on the person's perception of four general dimensions, which are perceived susceptibility, perceived severity, perceived benefits and perceived barriers. Perceived susceptibility refers to a person's perception that a health problem is relevant or the diagnosed illness is accurate. Perceived severity is when personal susceptibility is recognized and action will not occur unless the person perceives the severity to be high enough to have serious complications. Perceived benefits refers to the patient's belief that a treatment will cure or prevent an illness. Perceived barriers are: Perceived Costs – pertains to complexity, duration and accessibility of treatment; Motivation- the desire to comply with treatment and if peoples should do the treatment; and Modifying Factors- which include personality variables, patient satisfaction and socio-demographic factors.

Application to practice change. The goal of the project is to provide education to increase knowledge and attitudes on inappropriate antibiotic use for viral URIs and antibiotic resistance. The HBM is used to provide a model for addressing problem behaviors that evoke health concerns (HBM, 2014). The HBM states that a person's health-related behavior depends on the person perception of four critical areas: the severity of an illness; the person's susceptibility to the illness; the benefits of taking a preventive action; and barriers to taking the action. Perceived susceptibility is a person's perception of the risk of contracting a condition. Patients perceive a viral illness as a problem, and they are looking for a "cure all". Perceived severity is a person's feelings concerning the seriousness of contracting an illness. The patients will need to be educated on antibiotics and why they are not being given for viral illnesses, and realize that this could cause antibiotic resistance. Perceived benefits are beliefs regarding the effectiveness of the actions available in reducing the disease threat (the benefits of taking the action). The benefits of changing how the patients perceive viral illnesses will help decrease antibiotic resistance. Perceived barriers are negative aspects of the health action, which may act as an impediment to doing the recommended behavior. Patients will wonder if the viral illness will go away if they do not receive an antibiotic. This HBM will help give an understanding and predication of why patients insist on getting antibiotics for viral illnesses and how they will comply with the new education about antibiotic resistance (HBM, 2014). The educational intervention expected outcome is to improve the patient's perception of inappropriate antibiotics and antibiotic resistance (HBM, 2014).

EBP Change Theory

The model chosen to guide this EBP change was the *The Model for Evidence-Based Practice Change* by Rosswurm and Larrabee (1999). This model is designed for guiding multiple

practice change projects. The model guides nurses and other healthcare professionals through a systematic process for change to EBP. The six steps of the model are: Assess Need for Change in Practice; Locate the Best Evidence; Critically Analyze the Evidence; Design Practice Change; Implement and Evaluate Change in Practice; and Integrate and Maintain Change in Practice (Melnyk & Fineout-Overholt, 2011).

Application to practice change. The Rosswurm and Larrabee (1999) model, in relation to the practice change project, starts with assessing a need for change in practice. Within the organization, internal and external data was collected, and the EBP team prepared a clinical problem (Melnyk & Fineout-Overholt, 2011). The clinical problem guiding this EBP change project is the lack of knowledge about appropriate antibiotic use for viral upper respiratory infections (URI) and bacteria resistance in retail clinics. The defined clinical question asked*: "In a retail clinic where ambulatory adults present with viral symptoms, does providing education improve patient knowledge and attitude about appropriate antibiotic use for viral upper respiratory infections*?" Using the research question, best evidence has been located through sources such as websites, journals, electronic bibliographic databases and books (Melnyk & Fineout-Overholt, 2011). Some sources were Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, and Google Scholar. This evidence was critically analyzed by using an evidence table matrix, and the EBP team decided there was enough evidence to support the practice change project. A proposed practice change was designed and pilot tested. An implementation and evaluation of the change in practice was established after the pilot study. The EBP team implemented the designed plan and the post pilot data was compared to baseline data to decide if the new practice should be adopted. Once the EBP project had been implemented and evaluated, the information and recommendations were shared with all the

stakeholders and administrators, who must approve the new practice for sustainability (Melnyk & Fineout-Overholt, 2011). Lastly, the EBP change has been integrated and maintained.

Summary

This C-T-E structure discussed guided the EBP change. The concept of education was defined in many aspects. In relation to the clinical problem of a lack of knowledge of viral illnesses and antibiotic use, education can be used to decrease antibiotic resistance. The HBM helped give an understanding and predication of why patients insist on getting antibiotics for viral illnesses and how the patients will comply with the new education about antibiotic resistance (Currentnursing.com, 2014). The two desired outcomes for this EBP change project were: 1) An increase in knowledge about appropriate antibiotic use; and 2) An improvement of attitude associated with not getting antibiotics. The model for EBP change guided this project with a systematic process (Rosswurm & Larrabee, 1999). The project was developed using these six steps: Assess Need for Change in Practice; Locate the Best Evidence; Critically Analyze the Evidence; Design Practice Change; Implement and Evaluate Change in Practice; and Integrate and Maintain Change in Practice (Melnyk & Fineout-Overholt, 2011).

Chapter Four: Pre-implementation Planning

Madle, Kostkova, Mani-Saada, Weinberg, and Williams (2004), states educating and informing the public is essential for reducing the further development and spread of antibiotic resistance. In 1992, antimicrobial agents were the second most common medications prescribed by office-based physicians in the United States, which accounted for 12% to 14% of all drugs prescribed (Cantrell, Young, & Martin, 2002). In order to correct this problem, patients must be educated about appropriate antibiotic use for viral upper respiratory infections (URIs) and antibiotic resistance (Center for Disease Control and Prevention [CDC], 2013). The Doctor of Nursing Practice (DNP) leader is able to create an educational intervention and implement the evidence-based practice (EBP) change.

With the help of the staff of a Retail Health Clinic, the problem of inappropriate antibiotic use for viral URIs and antibiotic resistance was identified. Evidence showed the intervention of pre to post education to increase knowledge and attitudes of antibiotics for viral illnesses was an effective method of educating patients, which was collaboratively reviewed and approved by the interprofessional team. Pre-implementing planning for the EBP changed was developed with help from the clinic staff. The purpose of this chapter is to discuss the purpose of the project, project management, project materials and plans for project evaluation.

Project Purpose

The EBP change project was to provide education on inappropriate antibiotic use for viral URIs and antibiotic resistance in a retail health clinic setting. The targeted population for the EBP change was ambulatory adults presenting with viral URI symptoms at a retail health clinic. Individuals presented with signs and symptoms of a URI, such as low-grade fever, headache, sore throat, muscle aches, fatigue and cough. Individuals were 18 years of age or older of both

genders including all ethnicities. The plan was to have one on one educational sessions regarding inappropriate antibiotic use for viral URI's and antibiotic resistance. The intervention consisted of a Power Point presentation with information from the CDC about antibiotic use and viral URI's. The *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* (see Appendix B) was given pre and post educational intervention to assess for the outcomes of: a) An increase in knowledge; and b) Improved attitude of appropriate antibiotic use for viral URI's and antibiotic resistance.

Project Management

Organizational readiness for change. The first step when developing an EBP project is considering the organizational readiness for change, its adaptability and the meaningfulness of the project to the overall mission of a system (Harris, Roussel, Walters, & Dearman, 2011). This EBP change project was in line with the retail clinic mission and vision of helping customers lead healthier and happier lives. During several meetings with the retail clinic managers and educators about the repeated use of antibiotics for viral URI's, this project was warranted due to the need to inform the public consumers.

In retail health clinics, patients come in for that quick fix and want antibiotics regardless of illness. Educating patients on viral URI's is key to preventing antibiotic resistance. Quality measures are used to track antibiotic prescribing for Bronchitis, URI's and Pharyngitis in this setting. Depending on quality measure scores, clinic educators advise providers on EBP measures to use for viral URI's or to take continuing education courses. Competencies are given yearly on EBP measures for bronchitis, and URI's inappropriate antibiotic use. Price, MacKenzie, Metlay, Camargo, and Gonzales (2011) states patients' desire for antibiotics may be caused by misconceptions about viral illnesses and their treatments. These misconceptions are

compounded by clinicians' limited ability to educate patients about appropriate antibiotic use and acute respiratory illnesses during office visits along with time constraints and other demands (Price et al., 2011). The retail clinic was willing to provide the resources, education, time and materials needed for this project implementation.

Inter-professional collaboration. Interdisciplinary collaboration refers to a team of individuals with diverse training and backgrounds coming together from different disciplines allowing the team to capitalize on variations in approaches to problems and provide opportunities for learning about overlapping roles and establishing goals and missions of the team (Harris et al., 2011). The agency is a retail health clinic situated in a pharmacy retail store setting. The collaborative team formed for the EBP change project comprises of the project manager (PM; doctoral student), doctoral prepared nurse practitioner (NP; preceptor), regional clinic manager, NP clinic coordinator and educator for the retail clinics, an additional staff NP provider, oversight physician and Medical Assistant. The preceptor also works as a provider in a similar retail clinic and is helping with developing the EBP change project, education intervention tool and project surveys. The NP provider in the clinic assisted with the development of recruitment and educational materials. The other NP provider for the clinic helped distribute the educational intervention to patients and helped find areas that needed to be addressed as the educational tool was developed. The regional clinic manager was a resource for information that was needed in the educational information and intervention. These key points would be addressed in the educational materials. The NP educator helped provide additional resources for the educational intervention. The Medical Assistant (MA) assisted with distribution of cover letters, consents, educational materials and survey tools. The PM lead the team,

formulated the strategic direction, provided the educational intervention, distributed consents, cover letters, survey tools, and analyzed data.

Risk management assessment. A comprehensive needs assessment that involves an assessment of strengths, weaknesses, opportunities, and threats (SWOT analysis) was utilized for the EBP project. A SWOT analysis examines all aspects of a system and assists the PM and team in identifying internal and external aspects that may positively and negatively affect the project (Harris et al., 2011). The strengths identified within the EBP change project were strong clinical support, and consistent clinical staff group meetings. Group meetings and support helps the clinic become more familiar with EBP projects and future ideas. This is an opportunity for clinicians to become involved and develop ideas and questions to generate EBP.

An additional strength was that the project was aligned with company's mission and vision and company guidelines are backed by EBP. The vision is for customers to choose this company for their health and wellness needs because we understand their expectations. The mission is to offer services that help valued customers lead healthier happier lives. To communicate openly and honestly and accurately with stakeholders. To be caring neighbors and be involved in community in meaningful ways to improve patient outcomes and provide health education.

A weakness identified within the EBP change project were not having enough patients coming through the clinic. The retail clinic has only been open for a short period of time, which could cause low participation volumes for the project implementation period. Providers not being familiar with EBP could cause resistance in project implementation. The store team (where clinic is housed) not being engaged in the project may cause low participation volume due to

decrease in recruitment. An additional weakness was providers not having enough time during visits to provide education.

The opportunities identified within the SWOT analysis was the potential for a change in patient's attitudes in regards to inappropriate antibiotics for viral URIs. There would be an increase knowledge of EBP in providers of the retail clinic and an increase in provider's knowledge of inappropriate antibiotic use and antibiotic resistance. Another opportunity was a decrease rate of antibiotic prescribing from providers for viral URI's. There was also an opportunity for improved consumer knowledge regarding inappropriate antibiotics for viral URI's and a potential decrease in antibiotic resistance.

A careful PM recognizes risks in projects, anticipates them and works closely with the stakeholders in finding ways to overcome challenges (Harris et al., 2011). In order to address threats and barriers, education was provided to participants and providers regarding EBP. The first identified threat was the lack of participation from patients due to the limited time frame of patient visit. The solution to this threat was to minimize the educational intervention to 10-15 minutes. Clinic meetings were held weekly through the implementation period about the importance of the educational intervention being provided during patients clinic visit. Strategic approaches to a project is to identify alternatives to solution (Harris et al., 2011). The second threat identified was the PM consistency in providing education due to limited time frame of patient visit. The solution to this threat was to inform the patients the approximate time the intervention will take during the visit. The third threat was the patients not coming to clinic due to not being able to receive antibiotics for viral URI's. When patients think the treatment they are requesting is not going to be given, resistance to project participation may be exhibited. To resolve this threat, participant cover letters were distributed to patients and the PM was available

to explain the project. Interpersonal skills and effective communication is important to the PM role. People are more likely to respond positively to ideas if there is reciprocal trust between parties (Harris et al., 2011). Education can also improve patient's knowledge of inappropriate antibiotics for viral URI's. The fourth threat was providers being resistant to change and provider's perception of viral URIs and antibiotics. Providers may be resistant to change the way they practice medicine but given the education and the time, they may become less resistant. Excellent communication skills and relating well with others are essential for the PM (Harris et al., 2011). In order to win the providers support, in this EBP change, a demonstration of how the project addresses the intervention was necessary (Harris et al., 2011). During the first weekly meeting with providers, a demonstration of the intervention was given, which showed the allotted time needed for the project.

Organizational approval process. An initial step in developing a project is considering the organizational readiness for change (Harris et al., 2011). The idea for identifying the need for education on inappropriate antibiotic use for viral URI's came as a result of meetings with the organizational stakeholders and providers. The PM contacted the clinic compliance director for permission to do the project. The district clinic manager, district clinic trainer, clinic-credentialing director, regional clinic manager, and clinic coordinator /educator (NP) was presented with the idea of the project from the PM in which approval was given for the intervention that is aligned with the retail clinics vision and mission. Permission was granted for the EBP change project to occur at the targeted site (see Appendix C). The intervention was directly related to quality measures that are already in place for tracking inappropriate antibiotics for viral URI's.

Information technology. Knowing how to use technology and tools in support of projects and for sustainability of projects is key to success (Harris et al., 2011). In the beginning of project development information technology (IT) was used when searching relevant databases for the review of literature that supported an EBP change. Microsoft Office (Excel, Word and Power Point) was used for various project details. Surveys, flyers, cover letters and consents were developed using Microsoft Word. The data storage and analysis was conducted using Microsoft Excel. The educational program were developed within the Power Point presentation software. Power Point presentations were presented on a laptop used for the educational intervention.

Materials Needed for Project

Materials necessary for implementation included an estimate of 80 copies of the Participant Cover Letter (see Appendix D) describing the project and 80 copies of the Consent Form (Appendix E) for the projected 80 participants of the EBP change project. In addition, an estimate of 160 copies of the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* pre/posttest was needed (see Appendix B). A laptop computer and display screen was utilized to present education material. During the education program, participants received a condensed paper copy of the Power Point presentation, a pen and paper to copy notes. A copy machine was utilized to photocopy cover letters, consents, and handouts of the Power Point program. Paper products were printed on 8 ½" by 11" white paper. It is estimated that all participant documents would utilize approximately 10 sheets of paper. Therefore, approximately 800 sheets of paper was needed for the estimated 80 participants in the project. Additional copies (including pens) were obtained when participation increased during the program. Hard copy data were stored in a locked file cabinet at the PMs facility. Data was

stored on the PMs laptop and backed up in Dropbox. Data was analyzed via Microsoft Excel on a laptop computer. Microsoft Power Point and Word was utilized to create the education presentation and for document development. An exam room was reserved to present the education program to all participants.

Plans for Institutional Review Board Approval

The organization in which the EBP change project was implemented does not have an Institutional Review Board (IRB). An Exempt IRB approval plan was submitted to Chatham University's IRB in Pittsburgh, Pennsylvania on August 1, 2015. Revisions were needed for approval. Those revisions were changes to the IRB proposal, consent and approval letter. IRB approval was granted on July 23, 2015. (see Appendix F) Implementation began January 4, 2016.

Plan for Project Evaluation

Demographics. Participant's demographic information was collected including age, gender, and ethnic background during the administration of the survey pretest (see Appendix G). The participant's age was reported as a mean and range was obtained. Gender was reported by percent of participants that were male, female or transgender. Race was reported in percentages as either American-Indian, African American, Asian, Caucasian, Hispanic or other.

Outcome measurement. The first outcome of the EBP change project was an increase in participant's knowledge of appropriate antibiotic use and antibiotic resistance. This outcome was measured by the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* pretest (see Appendix B) and the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* posttest (see Appendix B) tools. The survey items were self-developed by Dr. Louise Murray. Permission was obtained to use survey tool (see Appendix H).

Evaluation tool. The *Improving Knowledge of and Attitude toward Viral Upper Respiratory Infection Survey* is broken into two sections of "Yes" and "No" questions of subjective opinion with the first section assessing participant "Knowledge" and the second survey section assessing "Attitude". The first five questions are related to knowledge. The participants chose either "Yes" or "No" in response to how they felt before and after the intervention. Each question is assigned a value of 20 points, and thus scores for the knowledge test range from 0 (no correct responses) to 100 (all correct responses). Individual participant scores were aggregated by respondent pre and posttest surveys in order to perform an overall survey comparative means analysis of pre and post data.

***Data analysis*.** A comparative means analysis was conducted to determine if new knowledge was acquired after the planned educational intervention. A score of 80% or greater on the post test was established as the benchmark that a significant level of new knowledge had been acquired after the educational intervention and the respondent was more knowledgeable about appropriate antibiotic use for viral URI's and antibiotic resistance. The percentage of respondents that scored 80% or better on the pretest was compared to the percentage of respondents that scored 80% or better on the posttest.

A comparison trend analysis of responses to the five items on the "Knowledge" portion of the survey were completed. Participant response to individual items of the pre and posttest were reviewed. The total number of participants that answered each item correctly was calculated as a percentage of correct responses, by question item. Each question item was compared from the pre to post test.

Outcome measurement. The second outcome expected of the EBP change project was an increase in attitude associated with not getting antibiotics for viral URI's. This outcome was

measured by the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* pretest (see Appendix B) and the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* posttest (see Appendix B) survey tools. The second portion of the survey is a set of five questions that are related to attitude.

Evaluation tool. The second part of the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Surrey* has five "Yes" and "No" questions of subjective opinion in regards to an increase in attitudes associated with not getting antibiotics for viral URI's. The participants chose either "Yes" or "No" in response to how they felt before and after the intervention. Each question is assigned a value of 20 points, and thus scores for the attitude test range from 0 (no correct responses) to 100 (all correct responses).

Data analysis. Individual participant scores were aggregated by respondent pre and posttest surveys in order to perform an overall survey comparative means analysis of pre and post data. A comparative analysis was conducted to determine if an increase in attitude was acquired after the planned educational intervention. A score of 80% or greater on the post test was established as the benchmark that a significant change in attitude had been acquired after the educational intervention and the respondent attitude increased in association with not getting antibiotics for viral URI's. The percentage of respondents that score 80%or better on pretest was compared to the percentage of respondents that score 80% or better on posttest.

A comparison analysis of responses to the five items on the "Attitude" portion of the survey was completed. Participant response to individual items of the pre and posttest was reviewed. The total number of participants that answered each item correctly was calculated as a percentage of correct responses, by question item. Each question item was compared from the pre to post test.

Data management. The demographic information and the results of survey data were scored by hand and manually entered into Microsoft Excel spreadsheet. The survey scores was calculated using Microsoft Excel formula. Following the conclusion of the project, the pretests, and posttests were securely locked by PM in a file cabinet at the project site where the pretests and posttests were graded. Data was stored on the PM password protected laptop computer and backed up in Dropbox, which is a password protected digital storage. Files were kept securely locked until five years after project completion where the tool will be disposed of in a locked, protected patient information container for shredding. Data files were saved for five years then destroyed by deleting files from computer system. The stored data was only accessed by the PM and faculty advisor upon request. The PM was the only person with available key to the drawer containing information.

Summary

In order for the EBP change project to be implemented, pre-implementation planning was needed. Finding an appropriate project site, assessing organizational readiness for change, and collaborating with the Retail Health Clinic staff was also needed for the project. In addition, IRB approval was obtained and materials were identified. Last, a project evaluation plan was explained. Finally, the EBP project was implemented.

Chapter Five: Implementation Process

This evidence-based practice (EBP) change project was designed to increase knowledge and attitudes of retail health clinic patients regarding inappropriate antibiotic use and antibiotic resistance. Patients come to retail clinics looking for antibiotics for viral upper respiratory infections (URIs) which is an inappropriate use of antibiotics. Patient's desire for antibiotics may be due to the misconceptions about viral respiratory illnesses and their treatments. These misconceptions maybe from clinicians limited ability to educate patients about appropriate antibiotic use (Price, MacKenzie, Metlay, Carmargo, & Gonzales, 2011). Madle, Kostkova, Mani-Saada, Weinberg, and Williams (2004) state there are a number of influential reports that emphasize that public education reduces the pressure on general practitioners to prescribe unnecessary antibiotics which reduces the patient expectations. This chapter describes the implementation of an EBP change project at a retail clinic using an educational intervention. The steps involved in the implementation of the project will be discussed.

Setting

The setting for the EBP change project was a retail health clinic in a large pharmacy drug store chain that specializes in providing patients high quality, affordable and convenient healthcare. The pharmacy drug store was located in a busy rural community that lies on a city/county line in Baltimore, MD. When arriving to the drug store, individuals have to go to the back of the store where the pharmacy is located and to the left of the pharmacy is the retail health clinic. The clinic has a waiting room with a registration area and two exam rooms. The educational intervention for the EBP change project was held in Exam Room #2 at the project site. The exam room was equipped with a laptop with Microsoft Power Point software, one table, two chairs and appropriate lighting.

Participants

The participants of the EBP change project were clinic patients 18 years of age or older of both genders including all ethnicities, who speak and read English. To be eligible to participate the individual must be presenting to clinic with signs and symptoms of a viral URI (low grade fever, headache, sore throat, muscle aches, fatigue and cough). Project participation was voluntary and discussed in the *Participant Cover Letter* (see Appendix D).

Recruitment

Participants were recruited for the EBP change project using several methods. One month (December 2015) prior to implementation, informational flyers describing the EBP project were displayed in the clinic waiting area and both exam rooms to draw interest in the project. Potential participants were made aware by the project manager (PM) and clinic staff during clinic visits. The clinic staff asked patients presenting with signs and symptoms of viral URI's, if they were interested in participating in the project. Once verbal confirmation was made by clinic staff, the PM explained the project further to patients and reviewed the consent materials (see Appendix E).

Information regarding the project was discussed during the Tuesday weekly meetings to the providers and medical assistants (MA) of the clinic (November/December 2015/January 2016). The PM was available during these meetings to discuss additional details regarding the project design and implementation. The PM gave the clinic staff a project time line and a calendar during the first weekly meeting, highlighting the start and end of the project, the days the PM was in clinic to deliver the educational intervention and the weekly meeting times. An email reminder was sent in the beginning of January 2016 to the providers and MA's reminding

them when the project would start and when the PM would be in clinic to deliver the educational sessions to the participants.

Implementation Process

Implementation began on January 4, 2016. The project occurred over 10 weeks. Each week there were four days when the PM was onsite to deliver educational interventions to willing participants. Times of the intervention varies including morning, afternoon, evenings, weekdays and weekends. Starting day one of implementation, participants were recruited for the EBP project as they present to the clinic with signs and symptoms of viral URI's, such as low grade fever, headache sore throat, muscle aches, fatigue and cough. When the patients present to clinic with symptoms of a viral URI, the MA informs them there was a Doctor of Nursing Practice (DNP) student here who was doing a project and ask them would they like to participate (see Appendix I). Once the individual gives verbal confirmation of participation, the MA gives them the *Participant Cover Letter* (see Appendix D) that explains the project purpose and benefits/risks and the PM addresses the project further.

Prior to educational intervention, the PM goes back over the participant cover letter, described the project, reviewed the *Chatham Consent Form* (see Appendix E) and answered any questions. The participant had an opportunity to read and sign the consent to participate once all questions had been addressed. After the consent was obtained the participant completed the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* (see Appendix B) pre-test that includes demographic information capture (see Appendix G), received a paper copy of Power Point slides to be used in presentation, paper copy of the *Get Smart: Know When Antibiotics Work* Brochure (Center for Disease Control and Prevention [CDC]; 2014), paper for notes and a pen. To ensure confidentiality, each participant was assigned a

numeric code, which was used on all documentation during the project. The numbering system began with "1" for the first participant and moved upward until the last participant was enrolled. Participants were given five minutes to compete the pretest. Once the pretest was completed, the PM placed it in a manila envelope labeled "Pretest".

During the initiation of the educational Power Point presentation, an overview of the project was presented and questions were answered by the PM. The Power Point educational intervention lasted approximately 10 minutes. The educational content that was covered referred to inappropriate antibiotic use for viral URI's and antibiotic resistance based on guidelines from the CDC. The participants were given handouts with a condensed version of the Power Point program to take home for education. After conclusion of the intervention, participants were given five minutes to complete the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* (see Appendix B) posttest. After posttest completion, the PM collected the posttest and placed it in a manila envelope labeled "Posttests" and the participant had completed the project.

Following the conclusion of the project, the pretests, and posttests were securely locked by the PM in a file cabinet at the project site where the pretests and posttests were graded. Data from the pretests and posttests were manually entered into a Microsoft Excel file for analysis. Data was stored on the PMs password protected laptop computer and backed up in Dropbox, which is a password protected cloud based digital storage medium. The PM was responsible for data collection and analysis, project implementation updates and information dissemination to stakeholders. During data collection, information was shared because dissemination of information is critical to the success of the project (Harris, Roussel, Walters, & Dearman, 2011). The PM reported findings to stakeholders during a video conference session with Power Point

presentation similar to the one during implementation. Dissemination of the project findings to clinic providers and the oversight physician was in a written format, which linked project outcomes to improved patient care and satisfaction.

Summary

In order to change clinical practice, EBP is needed. In retail clinics, education on appropriate antibiotic use is important. The growing health concern of antibiotic resistance is serious. Viral illnesses are commonly treated with antibiotics due to patients expecting a "cure all" for their sicknesses. This repeated use of antibiotics has increased the risk of antibiotic resistance and the ability to fight infections will become more difficult. There will be more resistance to common antibiotics, and it will be harder for patients to fight off diseases. Increasing knowledge about appropriate antibiotic use through education will most likely aid to decrease resistance risk. Patient's attitudes will improve regarding not receiving antibiotics for viral infections when the risks of repetitive antibiotic use is understood.

An integrative review of literature revealed the identification of patients with viral URIs wanting antibiotics for symptoms and showing that with education, it decreases the need of antibiotics and prevents antibiotic resistance. In a randomized control trial by Price, MacKenzie, Metlay, Camargo, and Gonzales (2011), after patients completed a computerized education module their desire for antibiotics for acute respiratory infections decreased. In addition, there was a change in attitude toward receiving antibiotics. A pharmacist initiated educational intervention by Rodis, Green, Cook and Pederson (2004) improved patient understanding of antibiotic resistance and knowledge of appropriate antibiotics. Antibiotic resistance is becoming increasingly evident, and it is important to address this clinical problem. The purpose of the EBP change project was to provide education on inappropriate antibiotic use for viral URI's and

antibiotic resistance in a retail health clinic setting. This EBP change project is in line with the retail clinic mission and vision of helping customers lead healthier and happier lives. In retail health clinics, providing education on viral URI's is key to preventing antibiotic resistance. This EBP change project aligned with the quality measures that track antibiotic prescribing for Bronchitis, URI's and Pharyngitis in this retail health setting. After implementation, data analysis is critical to assess the outcome objectives of increased knowledge of and improved attitudes regarding inappropriate antibiotic use for viral URIs and antibiotic resistance.

Chapter Six: Evaluation and Outcomes of the Practice Change Initiative

In a Retail Health Clinic located in a large pharmacy drug store chain, the problem of patients lacking education regarding inappropriate antibiotic use for viral upper respiratory infections (URIs) and antibiotic resistance was identified. An evidence-based practice (EBP) change project was implemented to educated patients about viral URIs and appropriate antibiotics. Participants were clinic patients presenting with signs and symptoms of a viral URI (low-grade fever, headache, sore throat, muscle aches, fatigue and cough). Participants were surveyed as to knowledge and attitudes toward antibiotic use for viral URIs and then they were shown a Power Point presentation titled *"Viral Upper Respiratory Infections and Antibiotic Resistance".* The educational content covered in the presentation was inappropriate antibiotic use for viral URI's and antibiotic resistance based on guidelines from the Center for Disease Control and Prevention (CDC). The educational video explained how viral URIs are not cured by antibiotics, which are only effective for bacterial infections. Taking antibiotics when not warranted can lead to antibiotic resistance. The purpose of this chapter is to discuss the analysis of findings gathered from project implementation.

Participant Demographics

During project implementation there were 40 participants shown the education regarding inappropriate antibiotic use. The participants mean age was 34 years old with a range of 20 to 59. There were 67.5% (n=27) Females, 30% (n=12) Males and 2.5% (n=1) Transgender. For individuals that participated in the project, 57.5% (n=23) were self-identified as African American, 27.5% (n=11) as Caucasian, 5% (n=2) as Hispanic and 2.5% (n=1) as American Indian and 7.5% (n=3) as Other.

Intended Outcomes

Outcomes must have an appropriate evaluation plan. The goal of the EBP change project was to increase patient's knowledge of appropriate antibiotic use and antibiotic resistance. The second goal was to improve patients attitude associated with not getting antibiotics for viral URI's.

Knowledge outcome. The first outcome of the EBP change project was an increase in participant's knowledge of appropriate antibiotic use and antibiotic resistance. This outcome was measured by the and the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* test (see Appendix B) tools. The survey items were self-developed by Dr. Louise Murray. Permission was obtained to use survey tool (see Appendix H). The *Improving Knowledge of and Attitude toward Viral Upper Respiratory Infection Survey* is broken into two sections of "Yes" and "No" questions of subjective opinion with the first section assessing participant "Knowledge" and the second survey section assessing "Attitude". The first five questions are related to knowledge. The participants chose either "Yes" or "No" in response to how they felt before and after the intervention. Each question is assigned a value of 20 points, and thus scores for the knowledge test range from 0 (no correct responses) to 100 (all correct responses). Individual participant scores were aggregated by respondent pre and posttest surveys in order to perform an overall survey comparative means analysis of pre and post data.

Attitude outcome. The second outcome expected of the EBP change project was an improved attitude associated with not getting antibiotics for viral URI's. This outcome was measured by the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* tool (see Appendix B) both pre and post education. The second portion of the survey is a set of five questions that are related to attitude. The second part of the *Improving*

Knowledge of and Attitudes toward Viral Upper Respiratory Infections Surrey has five "Yes" and "No" questions of subjective opinion in regards to an increase in attitudes associated with not getting antibiotics for viral URI's. The participants chose either "Yes" or "No" in response to how they felt before and after the intervention. Each question is assigned a value of 20 points, and thus scores for the attitude test range from 0 (no correct responses) to 100 (all correct responses).

Evaluation Plan

The outcome of increased knowledge of inappropriate antibiotic use and antibiotic resistance needed to be measured. In addition, the outcome of improved attitudes associated with not getting antibiotics for viral URIs had to be measured and assessed. According to Melnyk and Fineout-Overholt (2011), an outcome evaluation should be conducted to determine the impact of the change on the outcomes of clinical practice.

Measurement of increased knowledge. A comparative means analysis was conducted to determine if new knowledge was acquired after the planned educational intervention. A score of 80% or greater on the post test was established as the benchmark that a significant level of new knowledge had been acquired after the educational intervention and the respondent was more knowledgeable about appropriate antibiotic use for viral URI's and antibiotic resistance. The percentage of respondents that scored 80% or better on the pretest was compared to the percentage of respondents that scored 80% or better on the posttest.

A comparison trend analysis of responses to the five items on the "Knowledge" portion of the survey were completed. Participant response to individual items of the pre and posttest were reviewed. The total number of participants that answered each item correctly was calculated as a percentage of correct responses, by question item. Each question item was

compared from the pre to post test. The demographic information and the results of survey data were scored by hand and manually entered into Microsoft Excel spreadsheet. The survey scores was calculated using Microsoft Excel formula

Measurement of increased attitude. Individual participant scores were aggregated by respondent pre and posttest surveys in order to perform an overall survey comparative means analysis of pre and post data. A comparative analysis was conducted to determine if an increase in attitude was acquired after the planned educational intervention. A score of 80% or greater on the post test was established as the benchmark that a significant change in attitude had been acquired after the educational intervention and the respondent attitude increased in association with not getting antibiotics for viral URI's. The percentage of respondents that score 80% or better on pretest was compared to the percentage of respondents that score 80% or better on posttest.

A comparison analysis of responses to the five items on the "Attitude" portion of the survey was completed. Participant response to individual items of the pre and posttest was reviewed. The total number of participants that answered each item correctly was calculated as a percentage of correct responses, by question item. Each question item was compared from the pre to post test. The results of survey data were scored by hand and manually entered into Microsoft Excel spreadsheet. The survey scores was calculated using Microsoft Excel formula

Findings

The data suggests that the project had the intended outcome of increasing knowledge of inappropriate antibiotic use and antibiotic resistance. In addition, the desired outcome of an improved attitude associated with not getting antibiotics for viral URIs was attained. The educational Power Point presentation was an effective tool to accomplish project goals.

Overall knowledge pre-and post-test scores. Forty participants completed the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* pretest and posttest (see Appendix B), which was used to evaluate an increase in knowledge of inappropriate antibiotic use for viral URIs and antibiotic resistance. The overall pre-test scores ranged from 20 to 100 points, while the overall post-test scores ranged from 60 to 100 points. Thirty-five percent (n=14) of participants scored 100 points on pre-and post-tests. The aggregated pretest average was 70% while the aggregated posttest average was 97.5%. This showed the participants that viewed the educational presentation had a 27.5 mean point increase in knowledge.

A score of 80% or greater on the post test was established as the benchmark that a significant level of new knowledge had been acquired after the educational intervention and the respondent was more knowledgeable about appropriate antibiotic use for viral URI's and antibiotic resistance. The percentage of respondents that scored 80% or better on the pretest was 47.5% (n=19) and the percentage of respondents that scored 80% or better on the posttest was 95% (n=38). This benchmark was achieved.

Individual knowledge question analysis. The Improving *Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* test has five closed ended questions. Patients answered the questions with a "Yes" or "No" responses. In the data analysis the responses were assigned a number with "Yes" = 1 and "No" = 2. Table 1 highlights participants data regarding responses to knowledge based questions.

Question three, four and five of the knowledge test had the highest improvement. Question three and four were related to the mucous and nasal discharge color and whether it was a cause for needing an antibiotic. Question five asked whether viral respiratory infections require

antibiotic treatment. These questions showed there is a lack of understanding about viral URIs and based on the educational intervention there was an increase in knowledge. The survey results suggests an increase in education for population in regards to inappropriate antibiotic use.

Table 1

Knowledge Questions

Survey Item	Participants with Correct Responses on Pre-Test	Participants with Correct Responses on Post-Test
Q1	97.5% (n=39)	100% (n=40)
Q2	92.5% (n=37)	97.5% (n=39)
Q3	50% (n=20)	97.5% (n=39)
Q4	47.5% (n=19)	100% (n=40)
Q5	57.5% (n=23)	95% (n=38)

Note. See Appendix B for actual Question wording. Q = Question; % = percentage of participants; n= participants.

Overall attitude pre and posttest scores. Forty participants completed the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* pretest and posttest (see Appendix B). This test was used to evaluate an improved attitude of appropriate antibiotic use for viral URI's and antibiotic resistance. The overall mean pre-test scores ranged from 60 to 100 points, while the mean post-test scores ranged from 80 to 100 points. Fifty-five percent (n=22) of participants scored 100 points on pre-and post-tests. The aggregate pretest average was 86% while the aggregated posttest average was 97.5%. This showed the participants that viewed the educational presentation had an aggregated mean 11.5-point improvement noted in attitude regarding not receiving antibiotics.

A score of 80% or greater on the posttest was established as the benchmark that a significant level of increased attitude had been acquired after the educational intervention and the respondents attitudes were improved about appropriate antibiotic use for viral URI's and

antibiotic resistance. The percentage of respondents that scored 80% or better on the pretest was 72.5% (n=29) and the percentage of respondents that scored 80% or better on the posttest was 100% (n=40). This benchmark was achieved.

Individual attitude question analysis. The Improving *Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* test has five closed ended questions. Patients answered the questions with a "Yes" or "No" responses. In the data analysis the responses were assigned a number with "Yes" = 1 and "No" = 2. Table 2 highlights participants data regarding responses to attitude based questions.

Question one and three of the attitude test had the highest improvement. These questions were related to whether the viral URI will get better if antibiotics are taken. These questions showed there was a negative attitude in regards to not taking antibiotics for viral URIs. Based on the educational intervention there was a change in attitude in regards to antibiotic use. According to study results, attitudes will increase when the population is educated on inappropriate antibiotic use.

Table 2

Attitude Questions

Survey Item	Participants with Correct Responses on Pre-Test	Participants with Correct Responses on Post-Test
Q1	75% (n=30)	97.5% (n=39)
Q2	95% (n=38)	100% (n=40)
Q3	77.5% (n=31)	92.5% (n=37)
Q4	87.5% (n=35)	100% (n=40)
Q5	92.5% (n=37)	97.5% (n=39)

Note. See Appendix B for actual Question wording. Q = Question; % = percentage of participants; n= participants

Summary

In retail health clinics, the problem of the lack of knowledge about appropriate antibiotic use for viral URIs and prevention of bacteria resistance was identified. The project manager implemented an EBP project to educate patients about inappropriate antibiotics and antibiotic resistance. A review of literature showed that an educational intervention would increase patient's knowledge and improve attitudes of inappropriate antibiotics use for viral URIs. A Power Point presentation was used to deliver the educational intervention, which proved to increase knowledge and improve attitudes towards inappropriate antibiotic use. Data analysis revealed that the project outcomes were achieved. Project findings were disseminated to stakeholders and other clinic providers and this EBP change will continue within the clinics.

Chapter Seven: Implications for Nursing Practice

According to the Center for Disease Control and Prevention (CDC; 2013), stopping inappropriate and unnecessary antibiotic use will help slow down the spread of resistant bacteria. Antibiotic resistance is a serious health threat. The loss of antibiotics will impair clinician ability to fight infectious diseases and manage common infections (CDC, 2013). A literature review revealed education was needed in regards to inappropriate antibiotic use and antibiotic resistance. Educational interventions have proved to increase patient's knowledge and attitudes towards antibiotics for viral illness. According to Rodis, Green, Cook, and Pedersen (2004), an educational intervention improved patients understanding about antibiotic resistance and their role in this emerging health care problem was identified. Patients can be empowered to identify viral versus bacterial symptoms and the need for antibiotic therapy (Rodis et al., 2004). The evidenced-based practice (EBP) project proved to be effective at increasing knowledge and attitudes towards inappropriate antibiotic use.

The Doctorate of Nursing Practice (DNP) Essentials address competencies that are core to all advance practice roles (American Association of Colleges of Nursing [AACN], 2006). The DNP Essentials are outcome competencies for all graduates of a DNP program regardless of specialty or functional focus. These competencies prepare the graduate for those practice-learning experiences for a particular specialty (AACN, 2006). These Essentials have helped guide implementation of this EBP change. This chapter discusses how the AACN Essentials were applied to practice and the future implications within nursing.

Practice Implication

Essential I: Scientific underpinnings for practice. DNP graduates use knowledge from the sciences and translate that knowledge to benefit patients in the daily demands of practice

environments. The graduate will use science-based theories to determine the nature and significance of health and health care delivery. In addition, develop and evaluate new practice approaches based on nursing theories (AACN, 2006).

The educational EBP change improved knowledge and attitudes of patients in regards to inappropriate antibiotic use for viral upper respiratory infections (URIs) and antibiotic resistance. Through clinical experience and literature review, it was found that patients come to retail clinics seeking antibiotics for viral URIs and a "cure". To reduce unnecessary use of antibiotics in ambulatory care settings, interventions must include patient education (Rodis et al., 2004). Through the use of an evidence-based educational presentation participants in the project found they were educated about appropriate antibiotic use, which in turn improved their perspective and attitude regarding not needing them at the present time.

Stakeholders showed interest in the EBP ideas and agreed with the clinical problem of lack of education for patients about inappropriate antibiotic use for viral URIs. Other practitioners in the clinic were inspired by the use of nursing science to implement a practice change to improve knowledge and attitudes of patients in regards to appropriate antibiotic use. Implications for this essential, is future nurses will identify concerns and implement new practice ideas in the clinical setting. Through research, translational science can in turn affect practice through evidence-based interventions to improve quality and service. Another implication to enhance health care delivery would be to partner with other community clinics or health departments to bring this problem of inappropriate antibiotic use to the public.

Essential II: Organization and systems leadership for quality improvement and systems thinking. DNP graduates must be proficient in quality improvement strategies and in creating and sustaining changes at the organizational level (AACN, 2006). In advanced nursing

practice political skills, system thinking, business, and financial acumen is needed for the analysis of practice quality and costs. The DNP graduate will be able to develop and evaluate care delivery approaches based on scientific findings in nursing and other clinical sciences which will meet the current and future needs of patient populations (AACN, 2006).

The EBP changed project addressed the need to educate patients on inappropriate antibiotic use and antibiotic resistance. In order to sustain change of educating patients on the problem of inappropriate antibiotic use, other providers in the clinics will need to be educated on current evidence-based guidelines of the problem to ensure quality of health care and patient safety. Using the scientific findings from the EBP project, education should be provided to practitioners during staff meetings and uploaded on clinic website as a patient resource. This could help maintain quality improvement of this practice changed and meet the educational needs of patients

Essential III: Clinical scholarship and analytical methods for EBP. DNP graduates will be able to translate research into practice and disseminate and integrate new knowledge. The DNP program focuses on the translation of new science, its application and evaluation. DNP graduates generate new evidence through practice to guide improvements in practice and outcome of care (AACN, 2006). The DNP graduate are also prepared to evaluate quality improvement methodologies to promote safe, timely, effective and efficient patient centered care.

There are quality improvement measures in place at the practice site that tracks inappropriate antibiotic use for viral URIs. Implications would be to collaborate with other health care facilities and put data together to show more need of patient education. In addition, tracking other health care providers in other facilities could also add to the quality data to show the

problem of over prescribing of antibiotics that lead to antibiotic resistance. Partnering with other retail clinics to create a public health campaign about antibiotic resistance would be another implication. Literature reviewed noted patients are not educated on viral URIs and how antibiotics are not the cure. Implications for this essential are to address this need for education on inappropriate antibiotic use and antibiotic resistance by disseminating project results to other clinic providers so this practice change can be implemented.

Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare. Knowledge and skills related to information systems prepare the DNP graduate to apply new knowledge, manage individual and aggregate level of information and assess the efficacy of patient care technology appropriate for a specialized area of practice. The graduate must also be proficient in the use of information systems resources to implement quality improvement initiatives and support practice decision-making (AACN, 2006). The DNP graduate will be able to demonstrate the technical skills to develop and execute an evaluation plan involving data extraction from practice information systems (AACN, 2006).

The EBP projects educational tool was a Power Point presentation and this was an effective tool to educate the patients in the retail clinic. An implication for this need is for the DNP graduate to promote the use of videos as an effective tool to educate patients about health concerns. Educational videos could be uploaded to the clinic website and patient portal which would provide resources for the providers and patients to access at any time. Other implications would be to partner with other healthcare professionals to make a video that could reach all of the population that frequent the organization. Stakeholders and the project manager could create a video with a professional online education company that would be able to deliver the

information nationwide. There can be a partnership with the other providers of the other clinic sites to create a collaborative video.

Essential V: Healthcare policy for advocacy in healthcare. This essential discusses that DNP graduates are prepared to design, influence and implement healthcare policies that frame health care financing, practice regulation, access, safety, quality and efficacy. The graduate has the capacity to engage in the development and implementation of health policy at all levels. DNP graduates are leaders in the practice arena that provide critical interface between practice research, and policy (AACN, 2006).

There are no clinic policies for addressing antibiotic use for viral URIs in the retail clinic but there are quality measures that must be met in regards to inappropriate antibiotic use for viral URI's. These quality measures help providers to not treat viral URIs with antibiotics. Most of the other providers are not familiar with policy development. Future implications as a DNP leader would be to work on policy development with these providers, other retail clinics and local agencies to address the clinical problem. Other implications would be to collaborate with national pharmacy retail stores on campaigns regarding antibiotic resistance. In addition, work with the American Nurses Association and Maryland Nurses Association on policy position papers regarding education of inappropriate antibiotic use for viral URIs.

Essential VI: Interprofessional collaboration for improving patient and population health outcomes. DNP graduates are prepared in methods of effective team leadership and are prepared to play a central role in establishing interprofessional teams, participating in work of the team and assuming leadership of the team when appropriate (AACN, 2006). The DNP graduate is prepared to employ effective communication and collaborative skills in implementation of practice models, health policy, practice guidelines and standards of care. The

DNP graduate will lead interprofessional teams in the analysis of complex practice and employ consultative skills with intraprofessional teams to change healthcare (AACN, 2006).

Literature revealed a small amount of nurses participating in collaborative research in regards to inappropriate antibiotic use and antibiotic resistance. Majority of the literature involved physicians and pharmacists working with other physicians or pharmacists. There is a need for doctoral prepared advanced practice nurses to collaborate with other interdisciplinary teams to improve population health. The retail clinic site with other retail health organizations can collaborate with the American Nurses Association or the American Association of Nurse Practitioners on national health campaigns to bring awareness of antibiotic resistance. An implication would be for the DNP prepared leader to collaborate with other healthcare providers, physicians, pharmacists and advance practice nurses to continue to deliver education to patients in regards to inappropriate antibiotic use for viral URIs.

Essential VII: Clinical prevention and population health for improving the nation's health. DNP graduates engage in leadership to integrate and institutionalize evidence-based clinical prevention and population health services for individuals, aggregates and populations. The DNP graduate has a foundation in clinical prevention and population health (AACN, 2006). The DNP graduate will evaluate care delivery strategies using concepts related to community, environmental and occupational health and cultural dimensions of health (AACN, 2006).

During project implementation, it was found that patients were not aware of the importance of appropriate antibiotic use and antibiotic resistance. The EBP change project communicated the message to the public about using unnecessary antibiotics. The CDC (2014) *Get Smart Campaign* works to get information to the public about antibiotic resistance. During review of literature, this information is not being used frequently. Implications for the DNP

graduate is to educate the public about inappropriate antibiotic use and antibiotic resistance because evidence has shown there is a need for this information. Using education materials to give to patients with information from the CDC will help disseminate resources to the public to help educate the public about viral URIs and antibiotic resistance.

Essential VIII: Advanced nursing practice. The DNP graduate is prepared to practice in an area of specialization within a larger domain of nursing. Role preparation for specialty nursing practice, including legal and regulatory issues is part of DNPs curricula. The DNP graduate should guide, mentor and support other nurses to achieve excellence in nursing practice. The graduate will educate, guide individuals and groups through complex health and situational transitions (AACN, 2006).

This EBP change project revealed that patient's attitudes towards appropriate antibiotics could be influenced with education. Having a positive relationship with the patients will help with providing education to patients during visits. Developing positive relationships with patients is an implication that would provide education of inappropriate antibiotic use for viral URIs and antibiotic resistance. Implementation of the practice change revealed that other providers in the clinic are not familiar with EBP. Implications are for the DNP graduate to mentor and guide other providers with EBP projects. Another implication is to educate other providers when it is appropriate to treat with antibiotics using guidelines from the CDC.

Future Work

When conducting a review of literature specific to the clinical problem, the project manager (PM) determined there was a lack of education to the public about inappropriate antibiotic use and antibiotic resistance. In regards to the DNP Essential *Scientific underpinnings for practice,* there is a public need for more education on inappropriate antibiotic use for viral

URIs. Health providers need to find other methods to educate patients more effectively so that inappropriate antibiotic use decreases. Literature supported that educational videos and educational materials increased knowledge and attitudes of patients in regards to inappropriate antibiotic use for viral URIs, which improves healthcare quality. Dissemination of project results will be given to the other providers of the retail clinic which will increase the education given to the population on the problem of antibiotic resistance.

The EBP project was only conducted in one small retail health clinic; future projects should be conducted in all of the retail health clinic sites to be able to generate more participants. In addition, more healthcare providers could be involved to increase project enrollment. The other providers could include pharmacists, physicians and other advanced care nurses, in addition to other retail organizations to reach a broader population base.

Summary

The AACN (2006) Essentials outline the curricular and competencies that are present in programs for the DNP degree. The Essentials address competencies that are core to all advanced nursing practice roles. The Essentials in regards to inappropriate antibiotic use and antibiotic resistance help reveal future implications such as educating other providers, such as pharmacist, physicians or other advance practice nurses on EBP. In addition, they address building sustained relationships with patients to bring more awareness. Establishing relationships helps to build a trust with patients that they are receiving education that is evidenced based. Other future implications involve putting resources and videos on clinic websites and educating the public about the practice problem. The clinic websites will allow education to reach more of the population and spread education regarding inappropriate antibiotic us for viral URIs and antibiotic resistance.

Chapter Eight: Final Conclusions

The Doctor of Nursing Practice (DNP) prepared nurse seeks answers to clinical questions to access the best evidence to improve patient care and outcomes. Using the steps of evidence-based practice (EBP), the clinical problem of inappropriate antibiotic use for viral URIs and antibiotic resistance was addressed. Evidence was critically appraised, implemented, evaluated and disseminated to promote change. The EBP change was developed and implemented in a retail health clinic. The project results revealed that an educational intervention increased patient's knowledge and improved attitudes toward inappropriate antibiotics. This chapter summarizes the steps of the EBP project.

Clinical Problem

Within retail clinics, the lack of knowledge about viral illness and drug resistant bacteria should be addressed. If patients are well educated, the chance of developing antibiotic resistant bacteria could decrease (Center for Disease Control and Prevention [CDC], 2014). Antibiotic resistance can cause significant danger and suffering for people who have common infections that can be treated with antibiotics. When antibiotics no longer work, the consequences could be longer lasting illnesses, more doctor visits, and extended hospital stays (CDC, 2014).

Antibiotic resistance has been called one of the world's most pressing public health problems. Infections due to antibiotic-resistant organisms are associated with loss of productivity, poorer health outcomes and greater health care costs. Antibiotic resistance is estimated to cost $60 billion annually in the United States (Lee et al., 2014).

With patients', lack the knowledge about antibiotic use and viral illnesses the risk of antibiotic resistance could be reduced if patients understood that antibiotics do not cure viruses. Madle, Kostkova, Mani-Saada, Weinberg, and Williams (2004), states educating and informing

the public is essential for reducing the further development and spread of antibiotic resistance. This project provided evidence that health information websites have the potential to influence public opinions (Madle et al., 2004).

Literature Evidence

Aziz (2013) stated if patients are given leaflets with issues related to antibiotic resistance, and time is taken to explain to patients about antibiotics, patients will understand the antibiotics they take, which will aid in combating resistance. Madle et al. (2004) aimed to evaluate the effect of a health education website on the user's knowledge and attitudes of antibiotic prescribing. This literature supports the intervention of education regarding antibiotics and viral illnesses. Following the educational intervention, user's knowledge increased and expectations of receiving an antibiotic were reduced.

A random control trial by Price, MacKenzie, Metlay, Camargo, and Gonzales (2011) examined patient responses to an interactive computerized education module to reduce unnecessary antibiotic prescribing in the ED setting. The findings from this study support the role of a computerized interactive education to improve patient knowledge and attitudes regarding antibiotics for ARI' s as a part of the effort to improve healthcare quality (Price et al., 2011).

Rodis, Green, Cook, and Pedersen (2004) aimed to assess the effect of a pharmacist-initiated educational intervention on patient knowledge about antibiotic resistance and appropriate antibiotic use in adult patients with an upper respiratory tract infection (URTI). The second objective of this study was to determine patient satisfaction with pharmacist intervention (Rodis et al., 2004). The educational intervention improved patient understanding of antibiotic resistance and improved patient understanding about appropriate indications for prescribing

antibiotic therapy. Patients were also satisfied with the educational intervention about antibiotic resistance (Rodis et al., 2004).

Change Theories and Models

The Health Belief Model (HBM) addresses problem behaviors that evoke health concerns. This relates to the capstone project because patients look for antibiotics for viral illnesses, which is a problem behavior that can evoke the concern of antibiotic resistance (HBM, 2014). Janz and Becker (1984) stated that according to the HBM, behavior depends on two variables: the value placed by an individual on a particular goal and the individual's estimate of the likelihood that a given action would achieve the goal. The HBM provides a way to understand and predict a client's behavior in relation to their health and how they will comply with health care therapies.

The model chosen to guide this EBP change was the *The Model for Evidence-Based Practice Change* by Rosswurm and Larrabee (1999). This model is designed for guiding multiple practice change projects. The model guides nurses and other healthcare professionals through a systematic process for change to EBP. The six steps of the model are: Assess Need for Change in Practice; Locate the Best Evidence; Critically Analyze the Evidence; Design Practice Change; Implement and Evaluate Change in Practice; and Integrate and Maintain Change in Practice (Melnyk & Fineout-Overholt, 2011). This model was used to plan and implement the EBP change project, as well as evaluate and disseminate results.

Project Management

The first step when developing an EBP change project is considering the organizational readiness for change, its adaptability and the meaningfulness of the project to the overall mission of a system (Harris, Roussel, Walters, & Dearman, 2011). This EBP change project was in line

with the retail clinic mission and vision of helping customers lead healthier and happier lives. During several meetings with the retail clinic managers and educators about the repeated use of antibiotics for viral URI's, this project was warranted due to the need to inform the public consumers. The agency is a retail health clinic situated in a pharmacy retail store setting. The collaborative team formed for the EBP change project comprises of the project manager (PM; doctoral student), doctoral prepared nurse practitioner (NP; preceptor), regional clinic manager, NP clinic coordinator and educator for the retail clinics, an additional staff NP provider, oversight physician and Medical Assistant. The PM contacted the clinic compliance director for permission to do the project. The district clinic manager, district clinic trainer, clinic-credentialing director, regional clinic manager, and clinic coordinator /educator (NP) was presented with the idea of the project from the PM in which approval was given for the intervention that is aligned with the retail clinics vision and mission. Permission was granted for the EBP change project to occur at the targeted site (see Appendix C). An Exempt Institutional Review Board (IRB) approval plan was submitted to Chatham University's IRB in Pittsburgh, Pennsylvania on August 1, 2015. IRB approval was granted on July 23, 2015. (see Appendix F).

Project Implementation

The setting for the EBP change project was a retail health clinic in a large pharmacy drug store chain that specializes in providing patients high quality, affordable and convenient healthcare. The participants of the EBP change project were clinic patients 18 years of age or older of both genders including all ethnicities, who speak and read English. To be eligible to participate the individual must be presenting to clinic with signs and symptoms of a viral URI (low grade fever, headache, sore throat, muscle aches, fatigue and cough). Implementation was between January 4, 2016 and March 13, 2016. Prior to educational intervention, the PM goes

back over the participant cover letter (see Appendix D), described the project, reviewed the *Chatham Consent Form* (see Appendix E) and answered any questions. The participant has an opportunity to read and sign the consent to participate once all questions had been addressed. After the consent was obtained the participant completes the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* (see Appendix B) pre-test that includes demographic information capture (see Appendix G), received a paper copy of Power Point slides to be used in presentation, paper copy of the *Get Smart: Know When Antibiotics Work* Brochure (CDC, 2014), paper for notes and a pen. After conclusion of the intervention, participants were given five minutes to complete the *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* (see Appendix B) posttest. Data from the pretests and posttests were manually entered into a Microsoft Excel file for analysis.

Findings

An EBP change project was implemented to educated patients about viral URIs and appropriate antibiotics. Participants were clinic patients presenting to clinic with signs and symptoms of a viral URI (low-grade fever, headache, sore throat, muscle aches, fatigue and cough). Participants were surveyed as to knowledge and attitudes toward antibiotic use for viral URIs and then they were shown a Power Point presentation titled *"Viral Upper Respiratory Infections and Antibiotic Resistance".* The *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* was used to evaluate an increase in knowledge of inappropriate antibiotic use for viral URIs and antibiotic resistance.

The number of individuals that participated in this EBP change was 40. The overall pre-test scores ranged from 20 to 100 points, while the overall post-test scores ranged from 60 to 100 points. Thirty-five percent (n=14) of participants scored 100 points on pre-and post-tests.

The aggregate pretest average was 70%, while the aggregate posttest average was 97.5%. This showed the participants that viewed the power point educational presentation had an aggregate 27.5 point mean increase in knowledge.

A score of 80% or greater on the post test was established as the benchmark that a significant level of new knowledge had been acquired after the educational intervention and the respondent was more knowledgeable about appropriate antibiotic use for viral URI's and antibiotic resistance. The percentage of respondents that scored 80% or better on the pretest was 47.5% (n=19) and the percentage of respondents that scored 80% or better on the posttest was 95% (n=38). This benchmark was achieved.

The Improving *Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* was used to evaluate an improved attitude of appropriate antibiotic use for viral URI's and antibiotic resistance. The overall mean pre-test scores ranged from 60 to 100 points, while the mean post-test scores ranged from 80 to 100 points. Fifty-five percent (n=22) of participants scored 100 points on pre-and post-tests. The aggregate pretest average was 86% while the aggregate posttest average was 97.5%. This showed the participants that viewed the educational presentation had a mean 11.5 point improvement noted.

A score of 80% or greater on the post test was established as the benchmark that a significant level of increased attitude had been acquired after the educational intervention and the respondents attitudes were improved about appropriate antibiotic use for viral URI's and antibiotic resistance. The percentage of respondents that scored 80% or better on the pretest was 72.5% (n=29) and the percentage of respondents that scored 80% or better on the posttest was 100% (n=40). This benchmark was achieved.

Practice Implications

Through clinical experience and literature review, it is observed that patients come to retail clinics seeking antibiotics for viral URIs. To reduce unnecessary use of antibiotics in ambulatory care settings, interventions must include patient education (Rodis, Green, Cook, & Pederson, 2004). Stakeholders showed interest in the EBP ideas and agreed with the clinical problem of lack of education for patients about inappropriate antibiotic use for viral URIs. Other practitioners in the clinic were inspired by the use of nursing science to implement a practice change to improve knowledge and attitudes of patients in regards to appropriate antibiotic use. Implications for this essential, is future nurses will identify concerns and implement new practice ideas in the clinical setting. Through research, translational science can in turn affect practice through evidence-based interventions to improve quality and service. Another implication to enhance health care delivery would be to partner with other community clinics or health departments to bring this problem of inappropriate antibiotic use to the public.

The DNP graduate is prepared in methods of effective team leadership and prepared to play a central role in establishing interprofessional teams, participating in the work of the team and assuming leadership of the team. Literature revealed there were only a small amount of nurses participating in collaborating research in regards to inappropriate antibiotic use and antibiotic resistance. Implications for this essential is to partner with other retail organizations to collaborate with national organizations on health campaigns to bring awareness to antibiotic resistance. The DNP leader can collaborate with other healthcare providers, physicians and pharmacists to continue to deliver education to the public.

The DNP graduate will engage in leadership to integrate and institutionalize evidence based clinical prevention and population health services for individual aggregates and

populations. It was found patients were not aware of the importance of apocopate antibiotic use and antibiotic resistance. The CDC (2014) *Get Smart Campaign* works to get the information to the public about antibiotic resistance. During literature review, it was found this information was not being used frequently. Implications for this essential is for the DNP graduate is to educate the public about inappropriate antibiotic use and antibiotic resistance using education materials and information from the CDC. This will help disseminate resources to help educate the public.

Final Conclusions

The EBP change idea came from the project managers practice site. Working in retail health clinics patients come in looking for antibiotics no matter what symptoms they may have. Patients are think antibiotics are a "cure all". In retail, it is important to please the patient in order to have good patient satisfaction scores. This can be a battle to please the patient while practicing through evidence-based research practices. Patient reactions to not getting antibiotics for viral illnesses can range from calm to disappointment and unhappy with the service. In most cases in order to keep the patient satisfied, providers will give the patient an antibiotic to keep the patient happy. In most cases when patients are educated on the inappropriate use of antibiotics and antibiotic resistance, they become happier with the service. Although there is education and organizations like the CDC who educate on inappropriate antibiotic use, it seems as though the information is not getting to the public. The EBP change project showed that education about inappropriate antibiotic use for viral URIs and antibiotic resistance can improve patients knowledge and attitudes regarding not receiving these medications when not warranted. Providers must educate patients about the harmful effects antibiotics can cause and the increase of resistance this can cause. Providers must also educate other healthcare providers about only giving out antibiotics for bacterial infection and not viral illnesses.

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Appendix A

Evidence Matrix

Evidence as the Basis for Practice

Evidence	**Level of Evidence (I to VII)**	**Finding**	**Conclusion**	**Use of Evidence in EBP Project Plan**
Aziz (2013) the role of healthcare strategies in controlling antibiotic resistance.	Level VII	Existing and novel healthcare strategies play a major role in reducing antibiotic resistance, but require continuous education, training, resources, and collaboration from patients.	Shown evidence of methods that can improve the prescribing of antibiotics to patients but more studies are needed.	Include education to patients about antibiotics will aid in combating antibiotic resistance in practice change.
Madle, Kostkova, Mini-Saada, Weinberg, & Williams (2004) changing public attitudes to antibiotic prescribing: can internet help?	II	After using education website there was significant improvements in knowledge about the use of antibiotics and antibiotic resistance.	Health information websites can play a significant role in influencing public knowledge and attitudes about antibiotic prescribing.	Include health information websites can improve knowledge and attitudes about antibiotic prescribing.

Ong, Nakase, Moran, Karras, Kuehnert, & Talan (2007) antibiotic use for emergency department patients with upper respiratory infections: prescribing practices, patient expectations, and patient satisfaction.	IV	Physicians were more likely to prescribe antibiotics when they believed patients expected them. Satisfaction with emergency department visit was reported by 87% of patients who received antibiotics and 89% of those not receiving antibiotics. Satisfaction with the visit was reported by 92% of patients who believed they had a better understanding of their illness but only 72% of those who thought they had no better understanding.	Physicians were more likely to prescribe antibiotics to patients who they believed expected them. Patient satisfaction was not related to receipt of antibiotics but related to the belief they had better understanding of their illness.	Include that patient satisfaction was not related to receipt of antibiotics but related to the belief they had better understanding of their illness in the practice change.
Price, MacKenzie, Metlay, Camargo & Gonzales (2011) a computerized education module improves	II	The proportion of patients with low desire for antibiotics increased from 22% pre-module to 49% post-module.	An interactive educational kiosk improved knowledge about antibiotics and acute respiratory infections.	Include an interactive educational kiosk improved knowledge about antibiotics and acute respiratory tract infections (ARI's.) Learning correlated with changes in personal desire for antibiotics in practice change.

patient knowledge and attitudes about appropriate antibiotic use for acute respiratory tract infections.			Learning correlated with changes in personal desire for antibiotics.	
Rodis, Green, Cook & Pedersen, (2004) effects of a pharmacist-initiated educational intervention on patient knowledge about appropriate use of antibiotics.	II	Preintervention to postintervention surveys revealed a significantly improved knowledge of antibiotic resistance, patient's knowledge improved for cold and flu with cough and body aches. Satisfaction was expressed with educational intervention.	Educational intervention improved patient understanding of antibiotic resistance. Improved patient understanding about the appropriate indications for prescribing antibiotic therapy after educational intervention. Satisfaction with educational intervention about antibiotic resistance.	Include patients understanding of antibiotic resistance and appropriate antibiotic use improved following educational intervention.
Taylor, Kwan-Gett, & McMahon, (2003) Effectiveness of an educational intervention in modifying parental	II	At study entry, no significant differences between parents in the intervention and control groups regarding	Simple educational effort was successful in modifying parental attitudes about the judicious use of antibiotics.	Include educational intervention can significantly alter parental attitudes regarding use of antibiotics in children. Include distribution of brochures, brief discussion or videotape message is compatible with busy office practice.

attitudes about antibiotic usage in children.		attitudes for 15 of the 16 statements assessed. 6 weeks after receiving the antibiotic educational materials, parents had significant different attitude scores for 5 of the 9 statements about antibiotic use.		

Note. Studies used to denote sufficient evidence to support an evidence-based practice change.

Appendix B

Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey

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Antibiotics and Viral URIs Knowledge Pre/Post-Test

1) Patients with symptoms of the common cold require treatment with antibiotics.

Yes _____ No _____

2) The common cold and most upper respiratory infections are caused by viruses.

Yes _____ No _____

3) When a patient coughs up mucous that is yellow or green, an antibiotic is needed.

Yes _____ No _____

4) When a patient has nasal discharge that is yellow or green, an antibiotic is needed.

Yes _____ No _____

5) Respiratory infections caused by viruses require treatment with antibiotics.

Yes_____ No_____

Antibiotics and Viral URIs Attitude Pre/Post-Test

1) My condition won't get better unless I take antibiotics.

Yes _____ No _____

2) Antibiotics may kill the healthy bacteria in my body.

Yes _____ No _____

3) Unless I take antibiotics, my condition will worsen.

Yes _____ No _____

4) I know that taking antibiotics can cause serious side effects.

Yes _____ No _____

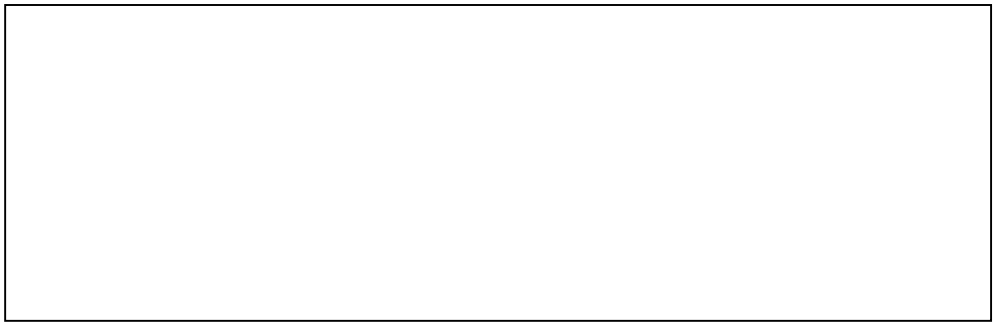
5) Antibiotic-resistant bacteria could infect me or my family.

Yes_____ No_____

Murray, L. (2015). *Improving Knowledge of and Attitudes toward for Viral Upper Respiratory Infections* (Doctoral capstone). Retrieved from http://library.chatham.edu/

Appendix C

Organizational Approval Letter



Letter of Intent to Participate

To whom it may concern:

I Alyssa Parrish Compliance Director of _____, have reached an agreement of understanding with Joan Bennett, MSN, Doctor of Nursing Practice candidate at Chatham University, regarding our clinics' participation in her project interest.

It is understood by both parties that:

1. Internal Review Board (IRB) approval will be obtained through Chatham University prior to implementation of any activities with students and a copy of such will be provided to the school.
2. Participant consent forms will be provided by Joan Bennett after approval through IRB at Chatham University These will be distributed and collected by the project manager (PM) prior to project implementation. Such participant consent forms will be reviewed and approved by Alyssa Parrish (Alyssa.parrish@rediclinic) prior to distribution to any patient.
3. Implementation will begin January 2016, with 8 week sessions approximately 10 minutes. A survey pretest and posttest will be used before and after educational sessions.
4. Participation is voluntary.
5. Survey instrument will be completely anonymous and no Personal Health Information ("PHI") will be collected from any patient at RediClinic. There will be no way for the PM to identify a particular participant. Findings will be reported in a code protected Microsoft Word document and used as evaluation of the programs effectiveness.
6. All findings will be used only by Joan Bennett for purposes to complete her project at Chatham University and will not be distributed outside the University without prior approval from Alyssa Parrish.

Sign _____ Date 3-16-2015

Contact Information 713-822-0023 /alyssa.parrish@redi.clinic.com

Appendix D

Participant Cover Letter

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Participant Cover Letter

Dear Participants:

My name is Joan Bennett and I am a master's prepared nurse practitioner currently pursuing a doctoral degree at Chatham University, Pittsburgh, Pennsylvania. I have chosen as my doctoral project the education of inappropriate antibiotic use for viral upper respiratory infections. The RediClinic at Rite Aid has agreed to allow me to present my educational program to retail clinic participants. This includes one on one sessions through a Power Point presentation on a laptop computer.

This project poses no risk to you. I will ask each participant to complete a pretest and after the educational session, a posttest to help determine program effectiveness. These surveys will be completed anonymously and are entirely voluntary. There will be no way to link a specific participant to his or her surveys, and these surveys will be shredded once the data is evaluated. These are for my use only. There will be no penalty for not participating.

I am asking you to consider your participation in this project. Thank you for your time and consideration.

Joan Bennett, CRNP

Emily E. Hopkins, PhD

Joan Bennett, Project Manager

Emily Hopkins, IRB Advisor

Appendix E

Consent Form

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CONSENT FORM

INVESTIGATOR(S) NAME:

Joan Bennett

EVIDENCE BASED PRACTICE PROJECT TITLE:

Education Regarding Inappropriate Antibiotic use for Viral Upper Respiratory Infections

PURPOSE OF THE EVIDENCE BASED PRACTICE PROJECT:

The purpose of the evidence-based practice (EBP) change project is to provide education on inappropriate antibiotic use for viral upper respiratory infections (URI's) and antibiotic resistance in a retail health clinic setting.

DESCRIPTION OF THE EVIDENCE BASED PRACTICE PROJECT:

The plan is to have one on one educational sessions on inappropriate antibiotic use for viral URI's and antibiotic resistance. The intervention will consist of an educational Power Point presentation with information from the CDC's *Get Smart Program*. The *Improving Knowledge of and Attitudes toward Viral Upper Respiratory Infections Survey* will be given pre and post educational intervention to assess for the outcomes of: a) An increase in knowledge; and b) Improved attitude of appropriate antibiotic use for viral URI's and antibiotic resistance.

During the initiation of the educational intervention an overview of the project will be presented and questions will be answered by the project manager (PM). Participants will be given 5 minutes to complete the pretest and the educational Power Point intervention will last 10 minutes. After conclusion of the intervention, participants will be given 5 minutes to complete the posttest. Total time commitment requested is approximately 20 minutes.

RISKS AND DISCOMFORTS:

The project may be taking place during actual clinic visit.

There is no part of the presentation that would cause discomfort.

There are no identifiable risks involved in participation.

BENEFITS:

Participants change in attitude in regards to inappropriate antibiotics for viral URIs.

Improved consumer knowledge of inappropriate antibiotic use for viral URI's in a retail health setting and potential decrease in antibiotic resistance.

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ALTERNATIVE PROCEDURES:

None. If the individual does not want to participate the individuals visit will continue as usual.

CONFIDENTIALITY:

Survey instruments will be completely anonymous. There will be no way for the PM to identify a particular participant.

Following the evaluation of data, surveys and consents will be kept securely locked until five years after project completion where the forms will be disposed of in a locked, protected patient information container for shredding.

TERMINATION OF PARTICIPATION:

Participation is voluntary

Participants can withdraw at any time without any negative consequences.

COMPENSATION:

Participants will not receive any compensation for participation.

There will be no cost incurred for this project.

INJURY COMPENSATION

Neither Chatham University nor any government or other agency funding this evidence based practice project will provide special services, free care, or compensation for any injuries resulting from this project. I understand that treatment for such injuries will be at my expense and/or paid through my medical plan.

QUESTIONS

All of my questions have been answered to my satisfaction and if I have further questions about this project, I may contact Joan Bennett, (project manager), by email joan.bennett@chatham.edu or by phone 443-956-2473. If I have any questions about the rights of evidence based practice participation, I may call the Chairperson of the Chatham University Institutional Review Board at 412-365-1358.

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VOLUNTARY PARTICIPATION

I understand that my participation in this evidence based practice project is entirely voluntary, and that refusal to participate will involve no penalty or loss of benefits to me. I am free to withdraw or refuse consent, or to discontinue my participation in this project at anytime without penalty or consequence.

I voluntarily give my consent to participate in this evidence based practice project. I understand that I will be given a copy of this consent form.

Signatures:

_____
Participants Name (Print)

_____ _____
Participant's Signature Date

I, the undersigned, certify that to the best of my knowledge, the subject signing this consent form has had the study fully and carefully explained by me and have been given an opportunity to ask any questions regarding the nature, risks, and benefits of participation in this evidence based practice project.

Joan I. Bennett, CRNP
Investigator's Name (Print)

Joan I. Bennett, CRNP 6/20/2015
Investigator's Signature Date

Emily E. Hopkins, PhD
Faculty Advisor Name (Print)

Emily E. Hopkins, PhD 6/20/2015
Faculty Advisor Signature Date

Appendix F

IRB Approval

eIRB Status Update - IRB Approved

mrobb@chatham.edu

Thu 7/23/2015 7:42 AM

To: Bennett, Joan <Joan.Bennett@Chatham.edu>;

Joan Bennett,

This message is to inform you that the IRB Chair has reviewed the Expedited eIRB titled "Education Regarding Inappropriate Antibiotic Use for Viral Upper Respiratory Infections" and it was IRB Approved.

Please review my suggestions as soon as possible.

Thank You,
Meigan Robb
07/23/15 07:42:15 AM

Appendix G

Demographic Information

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Demographic Information

AGE: _____

GENDER: Male_____ Female_____ Transgender_____

RACE: AfricanAmerican____Asian____Hispanic____Caucasian____AmericanIndian____

Appendix H

Tool Permission of Use

Louise G. Murray, DNP, CRNP, FNP-BC
549 Pond View Drive
Rydal, PA 19046

Dear Ms. Bennett,

This letter hereby grants you permission to use my self-developed metric tools "Antibiotics and Viral URIs Knowledge Pre- and Post-Tests" and "Antibiotics and Viral URIs Attitude Pre- and Post-Tests."

Regards,

Louise G. Murray, DNP, CRNP, FNP-BC

Appendix I

MA Recruitment Script

MA RECRUITMENT SCRIPT

Hi my name is _____, because you are presenting with signs and symptoms of a viral upper respiratory infection, would you like to participate in a project that will be conducted by a Doctor of Nursing Practice Student that involves inappropriate antibiotic use for viral upper respiratory infections and antibiotic resistance?

If yes: Thank you for choosing to participate, I will give you a cover letter that explains the project further, along with consent to participate. The Doctor of Nursing Practice Student will go over the project and consent form with you in further detail.

If no: Thank you and if you change your mind during your visit, the Doctor of Nursing Practice Student would still be able to present the project to you.