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Antibiotic Stewardship: Decreasing Antibiotic Use for Viral Upper Respiratory Infections

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Walden University

College of Nursing

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Merkessie Redix

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Walden University
2021

Abstract

Antibiotic Stewardship: Decreasing Antibiotic Use for Viral Upper Respiratory
Infections

by

Merkessie Redix

MSN, Walden University, 2014

BSN, University of Phoenix, 2010

Project Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

Walden University

May 2021

Abstract

Overprescribing antibiotics for viral upper respiratory infections is a common practice in the United States. This overprescribing of antibiotics can cause several health issues and increase health care costs. Despite the current guidelines recommended by the Centers for Disease Control and Prevention (CDC) the overprescribing of antibiotics by providers remains an issue. The purpose of this project was to educate providers on antibiotic stewardship for viral upper respiratory infections. The practice question was used to explore whether an educational program using concepts from Lewin's change theory and Kolb's learning theory would increase provider's knowledge about the current evidence-based prescriptive practices for treating viral upper respiratory infections. Six participants recruited by convenience sampling participated in the educational program and completed a pre and posttest to evaluate the extent to which their knowledge increased after participating in the program. The mean percentage difference between the pre ($M = 94.5\%$) and posttest ($M = 100\%$) was 5.5%. The findings suggest that providers were aware of the guidelines to treat viral upper respiratory infections; however, during post discussions, providers attributed their noncompliant practices to patient pressure and provider concern about poor ratings on patient surveys. It is recommended that providers review current practices and discuss strategies to increase compliance with the recommended evidence-based practice guidelines at monthly staff meetings. Increasing practitioners' knowledge of evidence-based practices for treating viral upper respiratory infections and awareness of their noncompliance in treatment practices have the potential to reduce antibiotic resistance, decrease health care cost, and optimize patient outcomes.

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Dedication

I dedicate my DNP project to my children, Hosie, Jr. and Cristian, my husband, Hosie, my mother, Sharon Jones, siblings, and to my late cousin Sandra Bledsoe. Thank you all for believing in me. Thank you for your endless prayers, love, and support.

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Section 1: Nature of the Project

Introduction

Inappropriate antibiotic use is a major ongoing concern in the United States Center for Infectious Disease Research and Policy [CIDRAP], 2017). Inappropriate antibiotic use increases antimicrobial resistance, health care costs, and allergic reactions (Fiore et al. 2017). According to CIDRAP (2017), patients often pressure providers into prescribing antibiotics before confirming bacterial infection. This premature prescribing causes overuse or misuse of antibiotics. Misuse of antibiotics refers to treatment that is not consistent with clinical guidelines (Centers for Disease Control and Prevention, [CDC], 2018). Decreasing antibiotic use for viral upper respiratory infections will decrease antibiotic resistance (World Health Organization [WHO], 2018). Antibiotic resistance occurs when bacteria is no longer responding to an antibiotic (WHO, 2018). Stakeholders who are affected by this practice problem include patients, health care facilities, families, and communities (CIDRAP, 2017). According to the clinical leader, this overuse and misuse of antibiotics for viral respiratory infections has also been identified locally at the intended project site located in Southeast region of the United States. In this Doctor of Nursing Practice (DNP) doctoral project, I focused on education about antibiotic overuse and misuse for treating viral upper respiratory infections. I focused on educating staff about antibiotic treatment overuse, also known as antibiotic stewardship, for viral upper respiratory infections. Educating providers through a staff educational program about antibiotic stewardship and the CDC guidelines can assist in minimizing or reducing the overuse and abuse of antibiotics. Providers who are

knowledgeable about information relating to antibiotic stewardship can incorporate this into their plan of care with the potential to decrease antibiotic resistance and improve patient health outcomes, which supports the positive social health impact of this doctoral project.

Problem Statement

In this DNP project, I addressed the lack of provider knowledge about treating viral upper respiratory infections in a walk-in clinic setting located in the Southeast region of the United States. Prescribing antibiotics before confirming bacterial infection contributes to antibiotic overuse (CIDRAP, 2017). The results of antibiotic overuse can lead to more doctor visits, longer hospital stays, and longer recuperation times. The estimated cost per patient is \$18,500 to \$29,000 annually (WHO, 2018). This antibiotic treatment overuse accounts for a 10 to 15 million-dollar societal cost annually (Barriere, 2014). According to Dadgostar (2019), the CDC estimated the annual cost of antibiotic resistance to be \$20 billion for health care and \$35 billion for loss of productivity. Nurse practitioners have often advocated delayed prescription as a critical approach towards meeting the needs of patients (Parry, 2015). According to Parry (2015), this strategy of delayed prescription has assisted in the reduction of and unnecessary use of antibiotics among patients seeking medical assistance. Various approaches are available when making these prescribing decisions. According to a systematic study review by Spurling et al. (2017), using the delayed prescribing method decreased the amount of antibiotic use. Spurling et al. (2017) believed providers can adopt the “wait-and-see prescription” that involves giving a prescription and advising the patient to wait a period of time before

using the prescribed medications. During this wait time, the patient must be aware of viral versus bacterial symptoms and the timeframe to start antibiotics if symptom resolution is not achieved. According to the CIDRAP (2018), antimicrobial stewardship is a group of interventions developed to monitor and improve the way antibiotics are given. One of the goals of this stewardship initiative is to decrease the spread of antimicrobial-resistant organisms. Educating the providers may result in increased use of the CDC guidelines, which can improve patient outcomes and reduce the gap in practice.

On a local level, this region was sixth in the United States for high antibiotic prescriptions (Arkansas Department of Health [ADH], 2017). Reports show patients were hospitalized for extended stay to treat *Clostridium Difficile* (C. diff; ADH, 2017). C. diff is an infection that causes severe diarrhea and affects people who have recent antibiotic treatment (ADH, 2017). Treatment for C. diff causes a rise in health care cost because of the extended hospital stay required. Several health care systems in this region have partnered with the CDC to promote an initiative called *Be Antibiotic Aware* that increases awareness about proper antibiotics use and antibiotic resistance (ADH, 2017). According to the clinical preceptor, data in the clinic where this doctoral project was implemented, there is a 75% rate of prescribing antibiotics for viral upper respiratory infections, which is not supported by the CDC's antibiotic stewardship program. Research by the CDC shows an increase in antibiotic use for various viral infections such as bronchitis, common colds, sore throats, and ear and sinus infections (CDC, 2016). The CDC (2016) identified treatment of viral infections with antibiotics as overuse and misuse of antibiotics.

Purpose

The ongoing overuse and misuse of antibiotics for viral respiratory infections continues locally at the project site. According to the clinical preceptor, currently there is a 75% rate of prescribing antibiotics for viral upper respiratory infections. That overuse is reflected in organizational data that compares diagnosis with treatment, which is a practice that does not align with the CDC's antibiotic stewardship guidelines. According to the clinical preceptor, providers at the project site lack the prescribing knowledge about antibiotic stewardship and the current CDC guidelines. In addition, as reported by the clinical preceptor, the site does not have a current protocol to support the prescribing of antibiotics; therefore, providers are left to treat based on their respective knowledge. The purpose of this evidence-based DNP project was to educate providers about evidence-based treatment guidelines for viral upper respiratory infections. This DNP project provided the education needed to assist providers in treating viral upper respiratory infections and decrease the current gap in practice.

Incorporating antimicrobial stewardship into an education program for practitioners can improve the way antibiotics are given and supports the stewardship initiative goal of decreasing the spread of antimicrobial-resistant organisms CIDRAP (2018). The practice-focused question was: Will delivering an educational program based on evidence-based practices and the CDC guidelines related to antibiotic stewardship increase provider knowledge about treating viral upper respiratory infections?

Increasing provider knowledge about current antibiotic practices has the potential to change their prescriptive practices and decrease the overuse of antibiotics when

treating respiratory infections. This supports compliance with the CDC guidelines on antibiotic stewardship, improve patient outcomes, and reduce the gap in practice.

Nature of the Doctoral Project

Sources

The nature of this doctoral project was an educational activity aimed at reducing the overuse of antibiotics by providers treating viral upper respiratory infections. I collected sources of evidence for this project from the following search engines at Walden University Library ProQuest, Google Scholar, CINAHL and PubMed. I used the following search terms: *antibiotic overuse*, *antibiotic misuse*, and *antibiotic stewardship*. I also used Google Scholar to do a general search using the following terms: *upper respiratory infections and overprescribing antibiotics for upper viral respiratory infections*. In addition, I obtained current guidelines on treating viral upper respiratory infections from the CDC website including the *Be Antibiotic Aware* initiative and from the American Academy of Pediatrics. Sources of evidence also included personal communication with clinic staff.

Approach

To conduct this project, I followed the Walden University Staff Education Manual. The providers at a walk-in clinic were the population of interest for this project. The providers included nurse practitioners, physician assistants, and medical doctors. The providers participated in an education session on viral upper respiratory infection treatment with the goal of increasing their knowledge and the potential for changing their practice perceptions. Providers were given a pre- and posttest to assess their knowledge

of treating viral upper respiratory infections before and after the delivery of the educational program. This educational project took place in one 60-minute session. Program information and content would have been emailed to any participants who could not attend. At the end of the program, participants were given a program evaluation survey to evaluate the overall learning activity.

The evidence-based literature that I used in this project was organized and graded using John Hopkins Nursing Evidence-Based Practiced Model (JHNEBP). This doctoral project can potentially decrease antibiotic resistance and adverse reactions. In the literature review and analysis, I identified the gap in practice that this clinical project aimed to reduce.

Significance

Antibiotic resistance has an enormous impact on society. It has been a common observation that providers have issued more than 90% of antibiotic prescriptions (Parry, 2015). According to Barnes et al. (2016), approximately 90% of these antibiotic prescriptions treated viral respiratory tract infections, which represents an overuse of antibiotic therapy. This overuse of antibiotics is also reflected at the project site at a rate of 75%. Providing education and awareness to the stakeholders may address the antibiotic treatment overuse problem.

The stakeholders in this project included patients, physicians, nurse practitioners, physician assistants, patients' families, and local and state health agencies. The stakeholders can have a positive impact on improving antibiotic stewardship. A decrease in antibiotic resistance and allergic reactions will occur when providers practice using

current treatment guidelines (CDC, 2019). Health departments can provide information on the implementation of antibiotic stewardship to outpatient facilities (Pew, 2016).

Nurse practitioners continue to grow as leaders in acute and urgent care setting, as well as in primary care. Nursing can have a tremendous effect on contributions toward antibiotic stewardship. The results of this project may be helpful in a similar area such as an inpatient hospital setting. Nurses can help address antibiotic resistance by participating in antibiotic stewardship in hospitals. Although staff nurses do not prescribe antibiotics, they are responsible for administering antibiotics, and are also responsible for evaluating the appropriateness of the antibiotic prior to administering (American Nurse Today, 2016).

The project supports Walden University's objective of promoting positive social change. This practice change will advance provider practice and improve the health outcomes of patients suffering from viral upper respiratory infections. According to Barriere (2015), having reliable mechanisms of treating infections and diseases among the population is essential for enhancing social and economic welfare. This understanding stems from the fact that a healthy person serves as a valuable resource and positively impacts economic growth and development (Barriere, 2015). Therefore, the project has various potential avenues for positive social change. The project results will be helpful in educating providers on the CDC guidelines for treating viral upper respiratory infections. This education has the potential to change or enhance provider knowledge on treating viral upper respiratory infections (Fiore et al. 2017). Changing or enhancing provider knowledge is a step closer to decreasing this major issue of antibiotic overuse.

Summary

Antibiotic overuse is a prevailing concern in the United States. Increasing provider knowledge to change their perception on treatment for viral upper respiratory infections was the purpose of this DNP project. The staff education intervention was aimed at educating providers about the risk of treating viral upper respiratory infections with antibiotics. The focus of this project was to encourage the practice of antibiotic stewardship and to foster compliance with the CDC guidelines. My goal for this project was to decrease the gap in clinical practice by changing the providers' knowledge and practice perception. In Section 2, I will discuss the background and context of this doctoral project.

Section 2: Background and Context

Introduction

The overuse of antibiotics is a major issue nationwide (Hasbach, 2015). According to the CDC, 30% of outpatient and 70% of inpatient antibiotics prescribed in the United States are unnecessary (CIDRAP, 2018). Prescribing antibiotics for viral upper respiratory infections is the most inappropriate use of antibiotics (CIDRAP, 2018). A virus, per etiological studies, causes upper respiratory infection. Bacterial causes for upper respiratory infections account for less than 10% of cases (Li et al., 2016, p. e3587). A literature review done by Li et al. (2016) showed that antibiotics were overprescribed for viral upper respiratory infections. Forty-five studies revealed that antibiotics were prescribed 83.7% of the time (Li et al. 2016). Over 24 years there has been a 28% increase in treating upper respiratory infections according to WHO (Li et al., 2016). In this project, I sought to reduce the overprescribing of antibiotics by answering the following question: Will delivering an educational program based on evidence-based practices and the CDC guidelines related to antibiotic stewardship increase provider knowledge about treating viral upper respiratory infections?

The purpose of this evidence-based project was to educate providers about the treatment guidelines for viral upper respiratory infections to decrease the overuse of antibiotics. Developing an educational plan involved literature research to educate providers to support best practices. In this section, I will discuss specific theories, the project's relevance to nursing, local background and context, and the DNP student role.

Concepts, Models, and Theories

I incorporated several models to develop this provider educational project. A concise evidenced-based approach guided this project and assisted providers with making appropriate care decisions. I used Lewin's change theory and Kolb's learning theory as the theoretical supports for this project. Additionally, I used The Antibiotic Stewardship Guide and John Hopkins Evidence Grading system that supported this project.

Morrison (2014) stated Lewin's change theory uses three stages for change: unfreezing, change, and refreezing. Therefore, I used Lewin's change theory because of its ability to display the advantages of change by using the three stages. According to McLeod (2017) Kolb's learning theory helps to process new information. I used Kolb's theory because it incorporated reflection that allowed the providers to process and align the new information with their evaluation of their past experiences. I also used Kolb's theory to assist with implementing change by helping providers focus on how they feel, what they saw, what they think about the change, and putting the proposed plan into action. The Antibiotic Stewardship Guide was initiated by the CDC to provide treatments based on antibiotic regulations and evidence-based guidelines (CDC, 2019). I used this CDC guideline when developing the education program to help the practitioners to improve their knowledge and determine appropriate antibiotic prescribing practices. I used John Hopkins evidence grading system to select the highest level of evidence to support this DNP doctoral project. Grading evidence determines the quality and validity of research (Vera, 2018) and enhanced the credibility of the project. Lewin's change theory, Kolb's learning theory, and the Antibiotic Stewardship Guide are publicly

available as open access; therefore, permission to use was not required. I received permission to use the John Hopkins Evidence Grading System.

Lewin's Change Theory

The purpose of Lewin's theory is to examine the transformation of previous knowledge (Nursing Theory, 2016). The concepts of this model include equilibrium, driving forces, and retaining forces (Nursing Theory, 2016). Changes occur due to driving forces, and restraining forces counter the driving forces. Equilibrium occurs when the restraining forces are equal to the driving forces. These forces can change the equilibrium by raising or lowering it. According to Morrison (2014), three stages of Lewin's change theory include unfreezing-change-refreeze. In the unfreezing stage, the staff was taught to unlearn bad behaviors and introduced to new behaviors that will promote change and ways to ensure tasks are done safely and efficiently. The final stage refreezing occurs when the change is successful and becomes permanent in the organization (Morrison, 2014). Lewin's theory is reflected in Table 1.

Table 1*Lewin's Change Theory Applied to Overprescribing Antibiotics*

Concept	Definition	Application	Goal
Unfreezing	Letting go of old/unsafe practices	Discuss current practices	Change knowledge and perception
Change	Changes in thoughts/feelings	Discuss evidence-based practice	Change knowledge and perception
Refreeze	Establishing change as new habit	Discuss perceived change in practice	Change practice perception

Note: Adapted from “Lewin’s Change Theory” by A. Petiprin, 2019. Copyright 2020 Alice Petiprin, Nursing-Theory.org

Kolb’s Learning Theory

Davis Kolb published his learning theory in 1984. Kolb’s theory consists of a learning cycle and learning style with four stages that can be aligned with the practice of antibiotic stewardship. Concrete experiences, reflective observation, abstract conceptualization, and active experimentation are the learning cycle stages (McLeod, 2017). Concrete experiences are situations the provider has experienced. An example of concrete experiences is a provider prescribing an antibiotic to a patient with a viral infection. An inconsistency between understanding and experience is reflective observation (McLeod, 2017). Abstract conceptualization is changing an existing concept such as introducing or reminding providers to follow CDC guidelines for treating upper respiratory infections (McLeod, 2017). The last stage, active experimentation, is realized

when providers apply the guidelines into practice (McLeod, 2017). Kolb's learning theory is reflected in Table 2.

Table 2

Kolb's Learning Theory Applied to Overprescribing Antibiotics

Concept	Definition	Application	Goal
Concrete	Direct human interactions	Patient assessment	Diverging
Reflective	The ability to understand why	Discuss the implications of antibiotic misuse/overuse	Assimilating
Abstract	Changing an existing concept	Discuss guideline reminders	Converging
Active Experimentation	Focuses on doing	Applying guidelines	Accommodating

Note: Adapted from "Kolb's Learning Styles and Experiential Learning Cycle" by S. McLeod, 2017, (<https://www.simplypsychology.org/learning-kolb.html>)

Antibiotic Stewardship Guide

The CDC (2018) defined antibiotic stewardship as: Measuring and improving how antibiotics are used by patients and prescribed by providers. The goal of antibiotic stewardship is to improve antibiotic prescribing, decrease antibiotic resistance, and protect patients from inappropriate use (CDC, 2018). According to the CDC (2018), there are seven core elements involved in antibiotic stewardship. The seven core elements are depicted in Table 3.

Table 3*Core Elements of Antimicrobial Stewardship*

Core Elements	Descriptions
Leadership Commitment	Dedicate human, financial, and IT resources
Accountability	Appoint one leader to responsible for program outcomes
Drug Expertise	Appoint one pharmacist to support improved prescribing
Act	Implement one prescribing improvement such as whether to prescribe and antibiotic or not, drug, dosage, and duration
Track	Monitor antibiotic resistance and prescribing
Report	Report regularly on antibiotic prescribing and resistance to the NPs, MDs, PAs, and nurses
Educate	Offer education on improving prescribing practices and antibiotic resistance

Note: Adapted from “Core Elements of Antimicrobial Stewardship”, by G. Sanchez et al., CDC 2017. [Cdc.gov/antibiotic-use/community/pdfs/16_268900-A_CoreElementsOutpatient_508.pdf](https://www.cdc.gov/antibiotic-use/community/pdfs/16_268900-A_CoreElementsOutpatient_508.pdf)

John Hopkins Nursing Evidence-Based Practice Model

John Hopkins Nursing Evidence-Based Practice Model (JHNEBP) was used in clinical decision-making through a problem-solving approach (Vera, 2018). The JHNEBP evidence grading system classifies evidence-utilizing levels I-V (Vanderbilt University, n.d.). Level I include randomized controlled trials (RCTs), experimental studies, and systematic reviews of RCTs. Level I signifies high quality studies. Level II studies are quasi-experimental studies. Level II studies are of good quality and have reasonably consistent results. Level III studies are non-experimental and are of low

quality with major flaws. Level IV studies are opinions by expert committees and are based on scientific evidence such as clinical guidelines. Level V consists of literature reviews, quality improvement evaluations, and case reports (Vanderbilt University, n.d.).

This information is reflected in Table 4 and was reprinted with permission.

Table 4

John Hopkins Evidence Grading System

Levels of Evidence	Quality Guides
<p>Level I Experimental study, randomized controlled trial (RCT) Systematic review of RCTs, with or without meta-analysis</p>	<p>A High quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence</p> <p>B Good quality: Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence</p> <p>C Low quality or major flaws: Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn</p>
<p>Level II Quasi-experimental study Systematic review of a combination of RCTs and quasiexperimental, or quasi-experimental studies only, with or without meta-analysis</p>	<p>A High quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence</p> <p>B Good quality: Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusions; reasonably consistent</p>

Level III

Non-experimental study
 Systematic review of a combination of RCTs, quasi-experimental and non-experimental studies, or non-experimental studies only, with or without meta-analysis
 Qualitative study or systematic review with or without a metasynthesis

Level IV

Opinion of respected authorities and/or nationally recognized expert committees/consensus panels based on scientific evidence
 Includes:
 · Clinical practice guidelines
 · Consensus panels

recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence

C Low quality or major flaws: Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn

A High quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence

B Good quality: Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence

C Low quality or major flaws: Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn

A High quality: Material officially sponsored by a professional, public, private organization, or government agency; documentation of a systematic literature search strategy; consistent results with sufficient numbers of well-designed studies; criteria-based evaluation of overall scientific strength and quality of included studies and definitive conclusions; national expertise is clearly evident; developed or revised within the last 5 years

B Good quality: Material officially sponsored by a professional, public, private organization, or government agency; reasonably thorough and appropriate

Level V

Based on experiential and non-research evidence

Includes:

- Literature reviews
- Quality improvement, program or financial evaluation
- Case reports
- Opinion of nationally recognized experts(s) based on experiential evidence

systematic literature search strategy; reasonably consistent results, sufficient numbers of well-designed studies; evaluation of strengths and limitations of included studies with fairly definitive conclusions; national expertise is clearly evident; developed or revised within the last 5 years

C Low quality or major flaws: Material not sponsored by an official organization or agency; undefined, poorly defined, or limited literature search strategy; no evaluation of strengths and limitations of included studies, insufficient evidence with inconsistent results, conclusions cannot be drawn; not revised within the last 5 years

Organizational Experience:

A High quality: Clear aims and objectives; consistent results across multiple settings; formal quality improvement, financial or program evaluation methods used; definitive conclusions; consistent recommendations with thorough reference to scientific evidence

B Good quality: Clear aims and objectives; consistent results in a single setting; formal quality improvement or financial or program evaluation methods used; reasonably consistent recommendations with some reference to scientific evidence

C Low quality or major flaws: Unclear or missing aims and objectives; inconsistent results; poorly defined quality improvement, financial or program evaluation methods; recommendations cannot be made

Literature Review, Expert Opinion, Case Report, Community Standard, Clinician Experience, Consumer Preference:

A High quality: Expertise is clearly

evident; draws definitive conclusions; provides scientific rationale; thought leader(s) in the field

B Good quality: Expertise appears to be credible; draws fairly definitive conclusions; provides logical argument for opinions

C Low quality or major flaws: Expertise is not discernable or is dubious; conclusions cannot be drawn

Note. Reprinted from *John Hopkins nursing evidence-based practice: Model and guidelines* (3rd ed.) by Dan and Dearholt, 2017. Copyright 2019 by Sigma Theta Tau International

Definition of Terms

The following terms are used throughout this project and are defined below:

Antibiotic stewardship: Antibiotic stewardship is a program that encourages the appropriate use of antibiotics. Antibiotic stewardship helps to decrease antibiotic resistance and improve patient outcomes (CIDRAP, 2018).

Bacteria: Bacteria is not a plant or animal. It is an organism with a single cell. There are several types of bacteria. They are found in water, plants, soil, and animals. (Brazier, 2017).

Broad-spectrum: The term broad-spectrum is used to describe antibiotics. Broad-spectrum antibiotics treat both gram positive and gram-negative bacteria (OMICS, 2015).

Providers: The term providers are used to include nurse practitioners, medical doctors, and physician assistants (Law Insider, n.d.)

Self-limiting: Self-limiting is a term indicating that an infection will resolve on its own without the need for antibiotics (Medi Lexicon, 2018).

Viral: The term viral is used to describe a type of infection. Small viruses that can affect good cells causing sickness such as, a common cold and flu cause a viral infection (Medline Plus, 2018).

Relevance to Nursing Practice

Existing Scholarship and Research

According to the CDC (2017), an increase use of antibiotics has caused an increase in antibiotic resistant bacteria. Unnecessary antibiotics place patients at risk for adverse reaction without clinical benefit (CDC, 2017). Respiratory tract infections are the reasons approximately 90% of antibiotics are prescribed (Llor & Bjerrum, 2014). Methicillin resistance *Staphylococcus aureus* (MRSA) is responsible for more deaths every year than the combination of homicides, human immunodeficiency virus (HIV), and emphysema (Llor & Bjerrum, 2014). Overprescribing broad-spectrum antibiotics causes MRSA, resistant urinary tract infection, and clostridium difficile (Llor & Bjerrum, 2014). Antibiotic stewardship is a part of the antimicrobial stewardship that uses interventions to decrease the inappropriate use of antibiotics (CIDRAP, 2018).

According to CIDRAP (2018), providers pressured to prescribe antibiotics for patients and prescribing antibiotics before bacterial infections are confirmed leads to antibiotic overuse. The risk of death, adverse reactions, increase in length and severity of disease, and health complications are all effects of antibiotic misuse (CIDRAP, 2018). One way to decrease or to prevent overprescribing antibiotics is by educating providers (CIDRAP, 2018). Patients are prescribed antibiotics for viral infections such as a common cold, sore throat, and acute bronchitis (Barnes et al. 2016). Treating viral upper

respiratory infections with antibiotics is an inappropriate use of antibiotics and this may indicate that the misuse is due to inappropriate education (Barnes et al. 2016). According to Barnes et al. (2016), 80% of common colds, 60% of pharyngitis, and 100% of bronchitis were treated unnecessarily with antibiotics. When searching the literature, I found there was a significant percentage of antibiotic use for self-limiting illnesses. Yue et al. (2019), reported that 58.6% of 74,648 prescriptions were given for uncomplicated respiratory infections due to the lack of education among new providers. Yue et al. (2019), further identified that inappropriate use of antibiotics was an ongoing issue in nursing practice. According to Shallcross and Davies, (2014), finding innovative ways to reduce prescribing, practice good hygiene, and teach patients to self-manage minor infections will help to reduce inappropriate antibiotic use.

Standard Practices

Accrediting regulatory, state, and nursing organizations support the CDC's standard practice guidelines (CDC, 2018). The CDC works to decrease antibiotic resistance through appropriate use education for patients and to improve the prescribing of antibiotics and use in humans (CDC, 2018). The Food and Drug Administration (FDA) and the CDC started initiatives to decrease antibiotic resistance (FDA, 2018). The FDA partnered with the CDC for the "*Get Smart: Know When Antibiotics Work*" campaign. The campaign educates the public using fact sheets, brochures, and web pages on preventing antibiotic resistant infections (FDA, 2018). Drug labeling regulations that emphasizes the careful use of antibiotics, regulations for health care providers to give antibiotics only when clinically necessary, and regulations for patient education on the

correct use of antibiotics are all initiatives of the FDA (FDA, 2018). Another initiative is encouraging the development of new drugs for bacterial infections (FDA, 2018). This initiative is due to antibiotic resistance. The FDA encourages providers to use these drugs appropriately in patients whose treatment options are limited (FDA, 2018). Studies show that prescribing a delayed antibiotic prescription for otitis media and sinusitis has been effective in reducing antibiotic overuse (Llor & Bjerrum, 2014). According to Llor and Bjerrum (2014), patients are more likely to not use or request antibiotics with good communication from the provider. Antibiotic stewardship has also been found to be effective in a European audit; this audit revealed that a reduction in antibiotic prescription had no effects on mortality (Llor & Bjerrum, 2014). This DNP project aligned with the CDC's stance on providing education to reduce antibiotic misuse and incorporated current evidence that assisted in educating providers at the project implementation site about appropriate antibiotic prescribing.

Other approaches to decrease antibiotic overuse included using delayed prescriptions, provider education, and mass media educational programs for the community and health care professionals and using good communication during consultation (O'Connor et al. 2018). According to O'Connor et al. (2018), mass media campaigns such as national TV advertising reduced antibiotic prescribing in England and France. Delayed prescribing has been shown to be beneficial when there is effective communication between the patient and the provider that include providers explaining signs of deterioration (O'Connor et al. 2018).

Annually, in the United States, approximately 23,000 deaths and 2 million illnesses are caused by inappropriate antibiotic use (Havers et al., 2018). Strengthening antibiotic stewardship will help to reduce the amount of antibiotics use for upper respiratory infections (Havers et al., 2018). The Mitigate tool kit is an intervention to improve antibiotic prescribing for upper respiratory tract infection in an urgent care setting (Havers et al., 2018). Providing effective education for antibiotic stewardship is the goal of Mitigation. Providers are educated on antibiotic resistance and alternative treatments via guidelines electronic reminders, and educational presentations. I used this doctoral project to assist in advancing nursing practice by improving patient outcomes by reducing the inappropriate prescribing of antibiotics through educating providers on antibiotic stewardship, which also includes patient education and effective communication, that will assist in decreasing or eliminating the practice gap.

Local Background and Context

Local Evidence

The doctoral project took place at a privately-owned walk-in clinic in the Southeast region of the United States. Providers at this clinic treat patients of all ages, for various illnesses. The most common illness seen in the clinic is upper respiratory infection. Most patients are ill for two days and feel they need antibiotics. Providers at this clinic will give in to patients because they feel pressured, to increase survey scores, and because they feel the patient paid to receive something other than over the counter medications. The clinical leader stated this type of practicing contributes to antibiotic resistance. Overusing antibiotics makes infections difficult to treat and highlights the

current gap in practice (AAP, 2013). In this walk-in clinic, where antibiotics are overly prescribed for viral respiratory infections, educating the nurse practitioners, physician assistants, doctors, and nurses may prove to be an effective intervention to assist in improving patient outcomes and decreasing the gap in practice.

Institutional Context

In 2014, the Southeast region of the United States ranked sixth in the United States for prescribing antibiotics (Arkansas Department of Health, 2017). According to the CDC (2017), antibiotic resistant infections will affect approximately two million people every year in the United States. In this facility, promoting correct antibiotic use is a priority (Arkansas Department of Health, 2017). In the Southeast region of the United States, Medicaid, Children's Hospital, Department of Health, Hospital Association, Association of Health – System Pharmacists, and the Medical Science College of Pharmacy have joined the CDC with promoting “*Be Antibiotics Aware*” week (Arkansas Department of Health, 2017). This campaign focuses on the importance of using antibiotics correctly and antibiotic resistance.

State and Federal Contexts Applicable to the DNP Project

The health care clinic or project site is committed to increasing the appropriate use of antibiotics for viral infections. The state can help by implementing antibiotic stewardship in existing state-run clinics. Implementing antibiotic stewardship can start first by establishing leadership in the health department to evaluate and incorporate stewardship activities in the facility. An initial assessment is done to assess the facility's current need and stewardship practices (CDC, 2019). If there is a need, stewardship

activities will be integrated and coordinated with quality improvement within the clinic and Quality Improvement Organizations (QIO) such as Centers for Medicare and Medicaid Services Quality Innovation Network-Quality Improvement Organizations (CDC, 2019). QIO consists of a group of consumers, clinicians, and health experts who help to improve health care quality for patients (Centers for Medicare & Medicaid Services [CMS], 2018). Once coordination between the facility and the QIO has been established, an educational plan and tools are developed for the clinic and the providers. Educating providers on communication helps the clinic maintain appropriate stewardship resources, raise public awareness, and incorporate antibiotic improvement plans. Leadership from the health department can educate policymakers on the reasons why appropriate antibiotic use is important (CDC, 2019). The providers did not receive any incentives for this educational plan. However, I am familiar with a clinic that incorporates proper treatment for pharyngitis and acute otitis media as part of a quarterly bonus.

Role of the DNP Student

As a DNP student and staff educator in the walk-in clinic, providing leadership is my role in this project. I was responsible for developing a project plan, implementing, and evaluating this project. I collaborated with my project team in all stages of the project. The project team included my preceptor, clinical manager, and the clinical leader in the walk-in clinic.

The providers in the clinic were presented with an educational in-service. According to Nurse Theory (2016), organizational change is accepted easily with good

leadership. Communicating the vision to everyone in the clinic with reinforcement helped the leadership provide support for the vision. Communication with providers helped them to see the need for change, as well as the logic behind such change (O'Connor et al. 2018). Communication with providers helped with reducing potential resistance.

I have been a nurse practitioner for five years. During my five years, I have treated multiple patients who expected to receive antibiotics after being sick for less than two days. These patients received conservative and symptom related treatments such as steroids, cough medication, and decongestants. All patients received a follow up phone call in three days post clinic visit. I have witnessed several providers prescribing antibiotics, when not needed, to please the patients and to increase patient satisfaction. Observing practices that are harmful to the patient and the community, practices that did not align with current antibiotic stewardship was my motivation to develop and deliver this project. I do not foresee any biases that would affect this project. My goal is to educate providers on the proper use of antibiotics for viral upper respiratory infections to promote antibiotic stewardship, decrease antibiotic resistance, and improve patient outcomes.

Role of the Project Team

A project team was developed to assist with this DNP project. The team consisted of a project manager, the clinical preceptor, and the clinic leader/data analyst. I served as the project manager. As the project manager, I was responsible for planning, developing, and implementing the project, with the assistance of the project team. My clinical preceptor, who is a medical doctor at the clinic, was experienced in developing

educational in-services and has been a preceptor for doctoral nursing students for several years; she was responsible for assisting with the development of the educational presentation. The clinic leader is a nurse practitioner. The clinical leader was responsible for providing approval to conduct this project, and she also assisted with the analysis of the collected data.

The project team was presented with educational information during pre-scheduled office meetings. Team members had the opportunity to share their expertise and contextual insights during the meetings. Three meetings were held to ensure everyone had a chance to voice their opinions and provide feedback. The project team approved the educational activity once development was completed and prior to delivery.

Summary

The purpose of this project was to increase providers' knowledge on treating upper viral respiratory infections based on the CDC guidelines. Educating the nurse practitioners, physician assistants, and physicians may prove to be an effective intervention to assist with increasing provider knowledge and changing their perceptions about practice, decreasing the gap in practice, and improving patient outcomes. Section 3 will start with the introduction and practice-focused question, further elaborate on the sources of evidence, discuss the project approach, procedures, analysis, and synthesis, and close with a summary.

Section 3: Collection and Analysis of Evidence

Introduction

Antibiotic resistance is a major concern globally (CDC, 2016). One of the causes of antibiotic resistance is the overuse of antibiotics. According to the CDC (2016), 30% of antibiotics were prescribed unnecessarily in an outpatient setting. The majority of unnecessary antibiotic use is seen in upper respiratory infections such as sinusitis, bronchitis, sore throats, and colds (CDC, 2016). The main strategy in controlling antibiotic resistance is to decrease inappropriate antibiotic use (CDC, 2016). The purpose of this doctoral project is to decrease the overuse of antibiotics for treating viral upper respiratory infections by delivering a staff educational learning activity focused on the appropriate treatment for viral upper respiratory infections. I determined the outcome of the intervention by the collection and analysis of data collected from the participants.

Practice Focused Question

Locally, overprescribing of antibiotics is a major issue; the Southeast region of the United States is sixth in the United States for high antibiotic prescribing (ADH, 2017). The negative effects of high antibiotic prescribing include antibiotic resistances and other adverse reactions. The reasons for inappropriate use include patient satisfaction, decreased provider knowledge, and time (Pew, 2017). Patients often request antibiotics when they are not needed, and when the provider does not prescribe, patients will leave bad reviews, causing patient satisfaction scores to drop (Ashworth et al. 2015). According to the clinical leader, due to the volume of patients, some providers often feel there is not enough time to educate the patients on when antibiotics are needed; it is

easier and quicker to write a prescription. Lastly, sometimes there was lack knowledge in antibiotic prescribing and providers need to be reminded or informed. I provided education to providers to increase their knowledge about treating viral upper respiratory infections to decrease antibiotic overuse. The practice question was: Will delivering an educational program based on evidence-based practices and the CDC guidelines related to antibiotic stewardship increase provider knowledge about treating viral upper respiratory infections?

Practice Alignment

The CDC works with health care providers to ensure patients receive the best health care and treatments. Antibiotics are used to protect people from infection or to manage infection (CDC, 2017). Although antibiotics have many risks, these risks do not outweigh the benefits when properly prescribed. Antibiotic resistance increases every time an antibiotic is consumed (CDC, 2017).

Research strongly suggests the proper use of antibiotics will improve patient care by decreasing antibiotic resistance and adverse reactions (Harris et al. 2016). Factors that influence antibiotic misuse include limited time, patient pressure and satisfaction, diagnosis uncertainty, and decision fatigue (Pew, 2017). In this educational project, I applied content from literature, validating the importance of proper antibiotic use.

A DNP prepared nurse is able to guide, support, and mentor other nurses to achieve the best in nursing practice (American Association College of Nursing [AACN], 2006). Educating providers on how to use antibiotics when treating viral upper respiratory infection helps to promote use of the recommended guidelines by the CDC.

This project can enhance patient care outcomes through current research translations. Reducing adverse reactions, antibiotic resistance, and health care cost will help to improve patient care locally and nationally, as well as decreasing the gap in practice.

Sources of Evidence

I reviewed and synthesized existing literature extensively to assist in identifying factors relating to the misuse and overuse of antibiotics for treating viral upper respiratory infections to aid in the development of the learning activity curriculum and to assist in reducing the gap in practice. Key search terms included the following: *Antibiotic misuse, upper respiratory infection, antibiotic resistance, overprescribing antibiotics, Lewin's theory, Kolb's learning theory, antibiotic stewardship, and antibiotic legislation.* I explored qualitative and quantitative studies that involved antibiotic overuse for upper respiratory infection. To support relevancy and best practice, I limited the literature search to articles published in the last 5 years.

I used the Walden Library to search the following databases: CINAHL full text, Embase, and Medline for current literature. I also used search engines that included Google, Firefox, and Safari to explore literature. I reviewed and selected articles according to the relevance to the topic and grade. I reviewed 75 articles on Embase, two were selected for inclusion according to topic relevance, 250 articles were reviewed on Medline, and 13 were selected according to relevance to the topic. I graded the 15 articles using the John Hopkins Level of Evidence to aid in the selection of the highest evidence that best supported the problem.

Evidence Generated for Doctoral Project

I reviewed evidence-based treatment guidelines and I developed an education program. I used the educational program to educate providers on evidence-based treatment guidelines for managing viral upper respiratory infections with the potential of improving their knowledge about treatment options. I worked closely with the project team throughout this process.

Participants

Providers practicing in the walk-in clinic were the target audience for this education activity. The clinic has six providers, some of whom are part time and others who are full time employees. I educated the providers on the evidenced-based practice including the CDC's recommendation for treating viral upper respiratory infections during a monthly staff meeting. Educating the providers successfully on viral upper respiratory treatment decrease antibiotic resistance and adverse reactions associated with antibiotics was also incorporated.

Procedures

After I received approval from the project site and from Walden University's Institutional Review Board (IRB), I delivered the doctoral project. Walden's educational manual guided the educational activity. I developed the educational activity that was reviewed by the project team thereafter and delivered via a PowerPoint presentation to the providers on the recommended treatments for viral upper respiratory infection. Due to the COVID-19 pandemic, I presented a webinar-based educational program with a pretest/posttest design.

Once a date and time was scheduled, I emailed an electronic flyer to the providers to invite them to the presentation. I also posted a flyer in the clinical area of the clinic. I gave a brief introduction and allowed time for the participants to complete the pretest that was emailed and accessed via a Survey Monkey link. The presentation was delivered from my home using Zoom a platform that allowed the participants to have access to the presentation from anywhere on a computer or mobile device. I used PowerPoint slides to deliver the live presentation that aligned with the educational objectives, goals, and supporting theories, reiterated in Table 5. The presentation lasted approximately 60 minutes with time allotted for questions at the end of the presentation.

Table 5*Educational Discussion*

Antibiotic Stewardship	Educational Objectives	Lewin's Theory	Kolb's Theory	Educational Goal
Leadership Commitment	Identify current prescribing practice for antibiotic use.	Unfreeze	Concrete	To increase provider knowledge.
Accountability	Identify reasons for antibiotic misuse.	Change	Abstract	To increase knowledge and perception
Drug Expertise	Describe the disadvantages of antibiotic use.	Change	Reflective	To increase knowledge and perception
Act	Explain criteria for prescribing antibiotics.	Change	Reflective	To increase knowledge and perception
Track	Recognize adverse drug reactions.	Change	Concrete	To increase knowledge and perception
Report	Identify unsafe antibiotic prescribing.	Change	Concrete	To increase knowledge and perception
Educate	Summarize current antibiotic guidelines	Refreeze	Active experimentation	Change practice perception

The participants accessed the presentation virtually from their location.

developed the project data collection documents, the pre- and posttests, the educational PowerPoint, and the program evaluation in Survey Monkey, and I sent the participants a link to access all documents via email. I provided a brief introduction, and then instructed the participants to complete the pretest to determine their knowledge on the program topic. The pre- and posttest are included in Appendix A. After the pretest, I delivered the

education activity. The educational activity PowerPoint is included in Appendix B. I allotted the participants time for questions prior to the post-test. After questions, the participants were able to access and complete the posttest. Lastly, after the posttest the participants completed the program evaluation. The program evaluation is in Appendix C. After the program was completed, I emailed each participant a copy of the PowerPoint and informational inserts from the CDC's website as printable material references for them to use as resources and as patient education materials .

Protections

After I received approval from the Walden's University IRB, invitations to attend the educational in-service were sent to the providers. I communicated a disclosure that this project is an academic requirement for the fulfillment of a Doctor of Nursing Practice degree at Walden University. I informed the attendees that participation in the learning activity was voluntary and that they could withdraw at any time. I also informed the attendees not to include their names on the tests or evaluation of the course, and that all information and data was confidential. I numerically coded the pre and posttest to assist in aligning the pretest with the respective posttest for each participant. I stored the projected data in my password-protected computer where the data will remain for 5 years. I maintained confidentiality as governed by the IRB's approval. Continuing education credit was not given for this educational presentation.

Analysis and Synthesis

I provided this educational project to educate providers on evidence-based guidelines to promote patient safety and antibiotic stewardship during treatment for upper

respiratory infections. I sought to educate providers and enhance their knowledge with this project. Due to the COVID-19 pandemic, this educational program was delivered virtually. I used Survey Monkey to collect project data. I developed the pre and posttest and the program evaluation in Survey Monkey and the link to access each assessment tool was emailed to participants, individually. I used descriptive statistics to analyze the collected data via SPSS. I used the difference between the pre- and posttest to determine if there was an increase in the practitioners' knowledge after participating in the education program. The clinical leader/data analyst assisted with data analysis. I believe the success of this project can help to decrease the gap in practice in overprescribing antibiotics for viral upper respiratory infections.

Summary

I reviewed existing literature that identified and supported antibiotic stewardship, and the CDC's antibiotic stewardship practice guideline that providers can use to support sound practice. In Section 3, I reflected on how the educational activity that focused on increasing provider knowledge regarding the treatment for upper respiratory infections was implemented. I incorporated information on the methodology of the educational activity, including application of the models and theories, the approach, the participants, and the protections. Lastly, I provided information on how the project data was analyzed and synthesized. In Section 4, I provide the project analysis that includes the findings, implications, and recommendations. In section 4 I also discuss the limitations and outcomes of the educational project.

Section 4: Findings and Recommendations

Introduction

The project site is in a state that ranks sixth in the United States for prescribing antibiotics (Arkansas Department of Health, 2017). Nationally, an estimated 47 million unnecessary antibiotics are prescribed yearly (CDC, 2018). Efforts are needed to address this overprescribing issue, to ensure that those who prescribe antibiotics are prescribing them appropriately. Through this staff education project, I sought to increase provider's knowledge on prescribing antibiotics for viral upper respiratory infections, to address the current gap in practice. The practice-focused question was: Will delivering an educational program based on evidence-based practices and the CDC guidelines related to antibiotic stewardship increase provider knowledge about treating viral upper respiratory infections?

Through a virtual educational presentation, I educated providers on antibiotic overuse and antibiotic stewardship. I developed the staff education program using evidenced based literature, constructs from Kurt Lewin's change theory, which was used to transform old knowledge into new knowledge, and David Kolb's learning theory, which incorporated a learning cycle and various learning styles. In this educational program, I aimed to increase provider knowledge to enhance their current practice to decrease antibiotic overuse and thereby decrease the existing practice gap. I delivered the educational program to six providers who deliver patient care services in a local clinic.

Sources of Evidence

The presentation consisted of a PowerPoint that included evidenced-based literature on viral upper respiratory infections, antibiotic use, antibiotic overuse, CDC guidelines, and antibiotic stewardship. This information was supported by current literature that resulted from searches conducted in the Walden University library through databases like CINAHL, Embase, and Medline for qualitative and quantitative studies about antibiotic overuse for upper respiratory infection. I used Lewin's change theory and Kolb's learning theory as the theoretical underpinnings for this project. I educated the providers on the appropriate timing for prescribing antibiotics for upper respiratory infections based on current CDC guidelines. Additional resources included educational pamphlets for providers that are also available for download on the CDC's website. The providers completed the pretest, the PowerPoint program, the posttest, and the program evaluation. I used descriptive analysis to determine if, after the PowerPoint presentation, there was a difference in provider knowledge by comparing the pretest and posttest scores. Upon completion of the program, I made the participants aware of an antibiotic awareness resource published by the CDC (Appendix D).

Findings

Following approval from the Walden IRB and the walk-in clinic's administration, I delivered the educational project according to Walden University's staff educational manual and the IRB approval criteria. The project team helped with scheduling the presentation and assisted with the set up and delivery processes. I invited the providers employed at the walk-in clinic to participate by email. The six providers who were

invited to the educational program, attended via the Zoom virtual platform on the day of the presentation, resulting in 100% provider attendance. The participants were informed about the project and the project disclosures via email prior to the program delivery.

The pre- and posttest consisted of six questions worth 16.7 points each. The mean difference between the pre- and posttest was 5.5%. The pretest results reflected that only two participants missed questions on the pretest. Both participants missed question six, which was a true or false question that asked if antibiotics are indicated for acute cough or bronchitis that has persisted for 1 week. Both participants scored 83.3% on the pretest, which were the lowest pretest scores. The other four participants scored 100% on the pretest, which resulted in an average pretest score of 94.5%. All participants scored 100% on the posttest.

The results of the pre- and posttest are depicted in Table 6..

Table 6

Pre and Post Test Results

Scores	Pretest Percentage	Posttest Percentage
Lowest Score	83.3%	100%
Average Score	94.5%	100%
Highest Score	100%	100%

The outcome of the educational program was surprising. The high scores on the pretest surprised me because this level of provider knowledge was not represented in organizational data that reflects current provider practice. The high provider pretest

scores did not align with provider practices identified through organizational data prior to undertaking this project. I identified possible rationales to support this lack of alignment between practice and knowledge. Rationales included:

- Providers were knowledgeable on appropriate prescribing practices for antibiotic stewardship but were not complying with such practices.
- Providers, despite their knowledge of appropriate antibiotic prescribing practices, succumbed to patient pressures to prescribe antibiotics.
- Providers prepared themselves with information relating to antibiotic stewardship prior to the delivery of the educational program.
- Providers were aware of antibiotic stewardship practice guidelines; however, providers were fearful of patient post treatment surveys that could reflect negatively on the provider's care.

Despite the surprising outcome of the educational program, the potential for positive social change remains. Providers are now aware that the organizational data that reflect their current practices does not align with their knowledge of appropriate antibiotic stewardship and the impact that practice and knowledge difference can have on patient care and outcomes, future antibiotic use and effectiveness, and on organizational data.

At the end of the educational session, the program evaluation was completed by 100% of the participants. The program evaluation consisted of 10 questions and can be found in Appendix C. The first eight questions were on a Likert scale with response ratings ranging from *strongly disagree* to *strongly agree*. The last two questions were

open-ended questions, with inquiries on how to improve the presentation and future presentations topic desires. I used Survey Monkey to collect participant data and, using descriptive analysis, I performed a detailed analysis. Question 1: I asked if the information learned during the presentation was helpful, and all participants strongly agreed with this question. Questions 2, 3, and 4: I asked about the quality of the speaker, and all participants responded strongly agreed. Questions 5, 6, and 7: I asked about the quality of the handouts, and all participants responded as strongly agreed. Question 8: I asked did the presentation change their perception, and, again, all participants strongly agreed. Questions 9 and 10 do not appear on the graph because they were open-ended questions. Question 9: I asked how could the presenter improve this presentation. Two of the participants responded, and both responded with N/A. Question 10 was: What other topics would participants like to see presented in the future. Two participants responded to this question, and one answered with N/A and the other answered none.

Unanticipated Limitations

The results from the pretest were surprising, as the lowest pretest score was 83% and the highest pretest score 100%. The surprising results of the pretest did not reflect the provider practice history that was identified in the organizational data. There are several reasons why the pretest result may have been so much higher than anticipated, and these reasons are reflected in the findings.

Another unanticipated limitation was the need to change the delivery of this program from a face-to-face delivery to a virtual delivery. While opportunity was provided for participants to discuss and ask questions in the virtual environment, the post

delivery discussion and questions may have been minimized due to the online program delivery format. During the post discussion, the providers openly discussed their awareness of the practice guidelines and their noncompliant practices, which some providers related to patient pressure and provider concern about poor ratings on patient surveys.

The importance of this educational project was reflected by the discussions and questions that occurred during and after the presentation. The data collected show that providers enhanced and/or tested their knowledge about how to treat viral upper respiratory infections, but more so learned the importance of ensuring that provider practice aligns with provider knowledge, which should in turn be reflected in organizational practice data. All participants identified that the information was helpful and relevant to their clinical practice. At the end of the presentation, the providers openly discussed their varying approaches to this practice issue and vocalized that patients have been very understanding about treatment once they are educated. This discussion highlighted and confirmed provider's need to support antibiotic stewardship through practice and how patient education can further enhance and support that practice.

Implications

The implications of this educational project can promote social change by educating or enhancing providers' knowledge on antibiotic stewardship. This DNP project focused on evidence-based practices for treating viral upper respiratory infections. Providers shared ideas about treatment options and the incorporation of patient education that can be effective when treating viral upper respiratory infections. Ideally, using

evidence-based practice for treating viral upper respiratory infections can reduce antibiotic resistances, decrease health care cost, and optimize patient outcomes.

Recommendations

Incorporating ongoing provider discussion about treatment for viral upper respiratory infections that incorporates current evidence like antibiotic stewardship and the CDC's treatment guidelines is beneficial to providers at the clinic. Incorporating information about the reason antibiotics are overprescribed and specific viral upper respiratory infections involved in the overprescribing problem has the potential to increase evidence-based prescriptive practices when treating viral upper respiratory infection and enhance care outcomes. Use of the CDC's website as a resource to gather informative handouts on the treatment for viral upper respiratory for providers and patients can be beneficial.

Contributions of the Doctoral Project Team

Due to the COVID-19 pandemic and the ensuing restrictions, interactions with the project team were limited but, overall, the team remained supportive throughout the project. The data analyst was able to assist me in analyzing existing organizational data and the project data that supported this DNP project. The clinic leader/data analyst is a nurse practitioner who approved the project. The clinic leader and clinical preceptor worked together and provided final approval of the educational in-service content before the in-service was scheduled. The clinical preceptor helped to gather participant emails to invite them to the educational in-service and also with other aspects of assuring a smooth virtual delivery of the project. Overall, the project team worked well together and

supported the development of this doctoral project. The project team recommended that I plan to reach out to urgent care clinics and other practices and primary care audiences to present my project in hopes of establishing and or enhancing antibiotic stewardship.

Strengths and Limitations of the Project

The strength of this project was based on existing literature of treating viral upper respiratory infections and the need to educate providers on the importance of overusing antibiotics and on the high rate of antibiotic over usage. Although the sample size for this project was small, 100% of the participants stated that the topic was relevant to their daily practice. The findings from this project are relevant in other areas such as dental offices, emergency rooms, and retail clinics because antibiotics are also prescribed in these areas. At local, national, and global levels overuse of antibiotics is still increasing (CIDRAP, 2018). Education can play an important role to help reverse this current common practice. The participants were engaged during and after the presentation and shared their interest in the presentation.

The limitation of the project was the small sample size; however, this could also be construed as strength. Having a small sample size allowed for engaging conversations that helped to refocus on the importance of effectively treating viral upper respiratory infections using evidence-based information. The limitations also included the high pretest scores of participants and the small change between participant pretest scores and posttest scores, which reflected minimal increase in knowledge among the participants. Therefore, I concluded the participants are aware of the evidenced-based prescriptive treatment for viral upper respiratory infections; however, the organizational data retrieved

reflected that provider treatment practices did not reflect compliance to the recommended treatment. Current provider practice may be attributed to noncompliance with treatment guidelines, providers succumbing to patient pressures to prescribe antibiotics, provider review of prescribing guidelines prior to attending the program, and the fear of negative post provider-care patient surveys.

Recommendations based on the findings of this project include:

Educate all health care providers and clinical staff on the evidence-based treatments and analyze organizational data about viral upper respiratory infection diagnosis within the clinic to ensure that current treatment aligns with antibiotic stewardship guidelines. Review current practice at the monthly staff meeting, and discuss with staff strategies to increase compliance with the recommended practice guidelines. This project can be used as a resource to bridge the gap in viral upper respiratory infection treatment.

Section 5: Dissemination Plan

After fulfilling the academic outcomes for Walden University's DNP program, and after final approval from Walden University Doctoral Project Committee, this manuscript will be published in ProQuest. I plan to present the project findings to the staff at the facility. In addition, I will present an abstract to unveil the findings at the annual local conference of the Arkansas Nurse Practitioner. I also plan to submit this manuscript to the Journal of Nurse Practitioners to be considered as a part of the DNP publication initiative. Lastly, there are several new clinics in my local area that can benefit from learning about this project and the project's findings and recommendations; I will share this evidence with those clinics.

Analysis of Self

As I think about my journey through this project, I am amazed that I was able to see it to completion, considering all of the setbacks I experienced during this process. I am happy that I persevered. I have learned so much about the treatment of upper respiratory infections and the reasons that lead to antibiotic misuse. I chose this topic because of the discrepancy in the project site's practice data and also because I believed it was important to population health at a local, national, and global level. Continued antibiotic misuse will increase antibiotic resistance that will reduce antibiotic effectiveness, when needed, especially in life threatening situations. As the project manager, upon identifying a practice problem, I developed the skills to address the practice problem. With the assistance of the project team, I was able to develop and deliver this project effectively. The team members worked together to solidify the

practice problem, review the project plan, and the process to assist in facilitating the project's completion.

Completion

I faced many challenges over the course of my DNP Project. The first setback was my initial approach to implement the project was not practical for the type of project I was trying to accomplish. As I began to develop my project, I became overwhelmed with performing the searches and organizing the information needed to support the evidence for the project. However, I considered the support of the organization's administration a blessing, which assisted me in moving forward. I worked closely with my chair, who has been absolutely awesome throughout this process by keeping me on track and motivated. After working with my chair for several quarters, which included sitting out a quarter, my project finally started to develop. I encountered several setbacks during this project process, which included loss of family due to the COVID-19 pandemic, the challenge of changing the mode of delivery of this project due to the pandemic, and other personal and professional challenges that also resulted from this health crisis. Once the setbacks were addressed, the project progressed. I now understand that the setbacks are all a part of the journey and reflect on my ability to rise above trials.

Working full time and taking care of family while in school was a challenge of its own. COVID-19 made things even harder, including altering the way children went to school. During my DNP project, I started my own practice with a partner, and currently I am dissolving the partnership. Given all of these challenges, I made it through by the grace of God, my chair, and the project team. By far, doctoral scholarship has been a

major challenge compared to my previous degrees. This journey has shown me that doctoral scholarship requires adaptation, flexibility, and persistence.

Summary

Upper respiratory infections are the most common acute health issue (Colvin, 2018). The cost of inappropriate viral upper respiratory infectious treatment for children and adults in the United States is three billion dollars annually (Colvin, 2018). The main factor contributing to antibiotic resistance is inappropriate antibiotic use for viral upper respiratory infections (Colvin, 2018). Providers are essential in helping to decrease antibiotic resistance. Provider knowledge and the incorporation of evidence-based care practices have the potential to decrease this gap in practice. Providers viewed the project as relevant and beneficial in expanding their knowledge on the topic. An educational project like this is simple to implement, cost effective, and can potentially have a positive impact on practice and patient health outcomes. Addressing this issue from the nursing community will require persistence. Providers need to be educated so they can educate their patients on the subject matter and consider approaches that can help improve this health care issue and support social change.

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Appendix A: Pre and Post Antibiotic Quiz

After reading the scenario for each question, please choose the answer that correctly answers the question.

1. Janine believes that Samantha has a bad cold. Concerned that her daughter's symptoms might get worse, Janine takes Samantha to an urgent care clinic. She hopes the doctor will give Samantha a prescription for antibiotics because she believes that will help Samantha feel better fast.

Is Janine correct that antibiotics will treat her daughter's bad cold?

Yes
No

2. Janine talks with the urgent care doctor about Samantha's cold symptoms. She explains that Samantha is very uncomfortable at night when she tries to sleep. Janine tells Dr. Smith that her neighbor's child was sick with a cold and was given antibiotics.

Should Janine expect Dr. Smith to treat Samantha with antibiotics?

Yes
No

3. Dr. Smith diagnosed Samantha with a cold, so he did not prescribe antibiotics. Frustrated that Dr. Smith won't prescribe antibiotics, Janine remembers that Samantha has some leftover antibiotics from the last time she was sick. She decides to go home and start giving Samantha the leftover antibiotics.

Is it safe for Janine to give Samantha leftover antibiotics?

Yes
No

4. Prescribing delayed antibiotics is a way to decrease antibiotic use.

True
False

5. It is appropriate to prescribe antibiotics for all patients with fever.

True

False

6. Antibiotics are indicated for acute cough or bronchitis that has persisted for 1 week.

True

False

Appendix B: PowerPoint

Antibiotic Stewardship: Decreasing Antibiotic Use for Viral Upper Respiratory Infections



Merkessie Redix, DNP student, MSN, APRN,
NP-C

Introduction



- ❏ Inappropriate antibiotic use is a major ongoing concern in the United States
- ❏ More than.....deaths are caused by antibiotic misuse
- ❏ Cost is \$18,000 to \$29,000 for individual sensitivity for antibiotic overuse
- ❏ \$10 to \$15 million was societal cost

Upper Respiratory Infections



Common viral infections treated with antibiotics are:

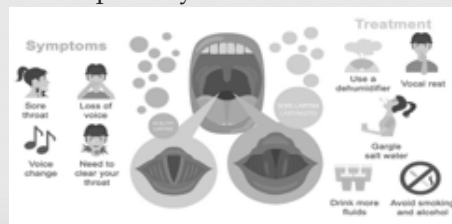
- Common Cold
- Bronchitis
- Pharyngitis

Upper Respiratory Infections



Viral versus bacterial upper respiratory infection

- Viral respiratory infections: Supportive measures
- Bacterial respiratory infections: Antibiotics



Antibiotic Use



- ☞ Antibiotics are used to treat bacterial infections such as:
 - ☞ Sinus Infections
 - ☞ Pneumonia
 - ☞ Strep throat
 - ☞ Otitis Media

Antibiotic Overuse



- ☞ Inappropriate antibiotic use increases
 - ☞ antimicrobial resistance
 - ☞ health care costs
 - ☞ allergic reactions



Reasons for Overuse



- ⌘ Patient satisfaction
- ⌘ Time constraints
- ⌘ Uncertain diagnosis
- ⌘ Decision Fatigue

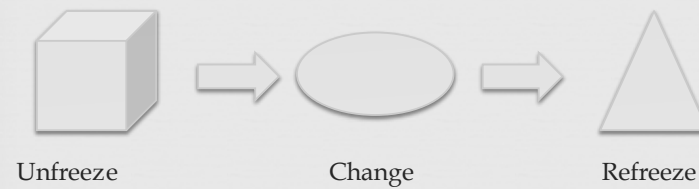


Theories



Lewin's Change Theory

Lewin's Change Theory focuses on unlearning old behavior to change and learn new behavior.

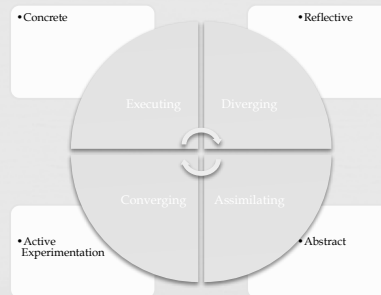


Theories



☞ Kolb 's Learning Theory

Kolb's Learning Theory focuses on the cognitive process and the ability to assimilate new knowledge.



CDC Treatment Guidelines



☞ Cough Suppressants

☞ Antihistamines

☞ Decongestions

☞ NSAIDS

CDC Guideline: Antibiotic Stewardship



- ☞ A group of interventions developed to monitor and improve the way antibiotics are given
- ☞ Stewardship goal is to decrease antibiotic use in regards to
 - ☞ Toxicity
 - ☞ Efficacy
 - ☞ Induced Resistance
 - ☞ Induced C. difficile
 - ☞ Cost
 - ☞ Discontinuation

Antibiotic Stewardship: Core Elements



- ☞ Leadership Commitment
 - ☞ Dedicate human, financial, and IT resources
- ☞ Accountability
 - ☞ Appoint one leader to responsible for program outcomes
- ☞ Drug Expertise
 - ☞ Appoint one pharmacist to support improved prescribing
- ☞ Act
 - ☞ Implement one prescribing improvement such as whether to prescribe and antibiotic or not, drug, dosage, and duration
- ☞ Track
 - ☞ Monitor antibiotic resistance and prescribing
- ☞ Report
 - ☞ Report regularly on antibiotic prescribing and resistance to the NPs, MDs, PAs, and nurses
- ☞ Educate
 - ☞ Offer education on improving prescribing practices and antibiotic resistance

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Appendix C: Evaluation Form

IN-SERVICE EVALUATION FORM

1. Presenter: Merkessie Redix, DNP Student
2. Presentation Topic/Name: Antibiotic Stewardship: Decreasing Antibiotic Use For Viral Upper Respiratory Infections
3. Date of Presentation:
4. The information I learned during this service was very helpful.

<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Somewhat Disagree
<input type="checkbox"/> Somewhat Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
5. The presenter was well prepared.

<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Somewhat Disagree
<input type="checkbox"/> Somewhat Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
6. The presenter was very knowledgeable regarding the subject matter of the presentation.

<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Somewhat Disagree
<input type="checkbox"/> Somewhat Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
7. The organization of this presentation contributed to my understanding of the material.

<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Somewhat Disagree
<input type="checkbox"/> Somewhat Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree
8. The visual materials used in this presentation contributed to my understanding of the material.

<input type="checkbox"/> Strongly Disagree	<input type="checkbox"/> Disagree	<input type="checkbox"/> Somewhat Disagree
<input type="checkbox"/> Somewhat Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Strongly Agree

9. The handouts used in this presentation contributed to my understanding of the material.

___ Strongly Disagree

___ Disagree

___ Somewhat Disagree

___ Somewhat Agree

___ Agree

___ Strongly Agree

10. Overall, this presentation was interesting, enjoyable, informative, and helpful.

___ Strongly Disagree

___ Disagree

___ Somewhat Disagree

___ Somewhat Agree

___ Agree

___ Strongly Agree

11. Did the presentation change your perception on this topic?

12. What did you like most about this presentation?

13. What did you like least about this presentation?

14. How could the presenter improve this presentation?

15. What other topics would you like to see presented in the future?

Appendix D: Teaching Tool

Viruses or Bacteria

What's got you sick?

Antibiotics are only needed for treating certain infections caused by bacteria. Viral illnesses cannot be treated with antibiotics. When an antibiotic is not prescribed, ask your healthcare professional for tips on how to relieve symptoms and feel better.

Common Condition	Common Cause			Are Antibiotics Needed?
	Bacteria	Bacteria or Virus	Virus	
Strep throat	✓			Yes
Whooping cough	✓			Yes
Urinary tract infection	✓			Yes
Sinus infection		✓		Maybe
Middle ear infection		✓		Maybe
Bronchitis/chest cold (in otherwise healthy children and adults)*		✓		No*
Common cold/runny nose			✓	No
Sore throat (except strep)			✓	No
Flu			✓	No

* Studies show that in otherwise healthy children and adults, antibiotics for bronchitis won't help you feel better.



**BE
ANTIBIOTICS
AWARE**
SMART USE, BEST CARE

To learn more about antibiotic prescribing and use, visit www.cdc.gov/antibiotic-use.

