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Provider Perception of Patient Satisfaction if Antibiotics Are Not Given for Upper Respiratory Infection

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Abstract

The purpose of this project was to assess if advanced practice nurse practitioners perceived patient satisfaction of patients seen in Metropolitan Retail Clinics was improved after educational materials were given to explain when antibiotics work. I hypothesized that provider perception of patient satisfaction would decrease unnecessary prescribing of antibiotics after providing patient education? This project used questionnaires to collect data from control and intervention groups to demonstrate a gain in provider perception if patient satisfaction after education was given in the intervention group.

The results of this project did not reveal to the primary investigator what was originally assumed, that provider perception of patient satisfaction would improve following patient education. A paired-samples t-test was explored among the intervention group as responses to the pre-test and post-test question were compared. These results, determined using criteria for significance of $p < .05$, compared initial mean of the pretest question to the posttest question of the intervention group. This test was found to be not statistically significant, $t(54) = -1.590$, $p = .118$, which indicates that while a change was present it cannot be interpreted that the intervention caused this change on pre and post questions at Time 1 ($M=2.3091$, $SD=1.19989$) at Time 2($M=2.7273$, $SD=.98985$).

This increase demonstrates promise for future research, which this project was unable to prove. If this project were repeated by the investigator, it would be recommended that a larger sample size be used, the project occur during cold and flu

season, and that providers indicate whether there is a change in provider perception of patient satisfaction following the standard of care among the control group.

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Introduction

Provider perception of patient satisfaction is useful in predicting provider behaviors including prescribing, and is used on a daily basis in clinical practice (Little et al, 2004). Many authors have documented that health care provider's perceptions need to be accurate to promote better communication to further meet patient expectation and satisfaction during a medical visit (Hall, 2011). According to Hudon, Fortin, Haggerty, Lambert, & Poitras, (2011) patient satisfaction is becoming the core value in family medicine and stands at the forefront as we seek to identify patient-centered-care to gain greater compliance to medical advice. With the emergence of antibiotic resistance, it was necessary to evaluate provider perception of patient expectations related to prescribing antibiotics. Little, et al. (2004) evaluates provider perception through an observational study where providers did not elicit expectations of the patient thus leading to unnecessary antibiotic prescriptions. Therefore, it is useful to understand how patients may influence a provider's perception and develop a strategy to reduce any inappropriate prescribing behavior (Bauchner, H., Pelton, S., & Klein, J. 1999) while setting quality of care expectations.

Antibiotic resistance is a complex and potentially catastrophic problem in the United States and around the world. The Centers for Disease Control (CDC), 2010, reports an estimate of over 2 million people becoming ill from antibiotics every year and as a result at least 23,000 die. Many of these secondary infections are shown through evidence based research to be resistant to antibiotics they are designed to treat. For this reason an intervention is needed to prevent new resistance and keep current antibiotic resistance from spreading (CDC, 2010).

Antibiotics are commonly prescribed in medicine today, with less than 50 percent of these having no optimal effect (CDC, 2010). Despite these findings, antibiotics continue to be prescribed extensively for upper respiratory tract illness (URTI) where they are unlikely to change the course or outcome of the infection (Altiner et al., 2012). Regardless of efforts to improve antimicrobial prescribing by providers, a detailed understanding of current prescribing influences and patterns is needed. According to the Avorn et al. (2001), the World Health Organization (WHO) states that patients play a key role in antibiotic prescribing; as it is often their demands, requests, or actions that prompt inappropriate prescribing of antibiotics to begin with. On the other hand, it has been found that provider's incorrect perception and failure to elicit patient expectations result in unnecessary prescribing practices and noncompliance by the patient (Little et al., 2004). Hall (2011) found that sometimes the perception of providers is wrong or even confused or oblivious to patient expectations and an improvement in interpersonal sensitivity is needed to improve patient outcomes. Current treatment guidelines promote prudent prescribing but antibiotics continue to be prescribed when not clinically indicated (Strandberg, Brorsson, Hagstam, Troein, & Hedin, 2013).

Definitions

While discussing antibiotic resistance, there is a need to define commonly used terms. According to the CDC, (2010) antimicrobials include antivirals, antifungals antibiotics in addition to other medications that treat life-threatening diseases. The use of antimicrobial agents began to trend downward toward the end of the 20th century in ambulatory care. This trend may have been due to decreased prescribing, increased patient understanding, or prescribers aim to properly use antibiotics. On the other hand,

an increase was noted for newer more expensive medications, "azithromycin, clarithromycin, quinolones, and amoxicillin/clavulanate" (McCaig, 2003, p 435). These medications are not effective first line therapy for URTI's and increase the possibly of antibiotic resistance. Antibiotic resistance occurs when germs change in a way that reduces or eliminates the effectiveness of drugs used to treat them (CDC, 2010). Antibiotic resistance is a problem to public health as treatment for some pathogens is limited and the solution for discovering new antibiotics is unable to keep pace with the resistance of bacterial pathogens (Panagakou et al., 2011.) CDC defines appropriate antibiotic use as the practice that maximizes the use of these medications while minimizing toxicity and resistance (CDC, 2010). "Upper respiratory tract infections, (URTI's) are typically either bacterial (treatable with antibiotics) or viral (treatable only symptomatically," Stivers, Mangione-Smith, Elliott, McDonald, & Heritage, 2011, p. 949). When antibiotics are used in this manner it supports the prudent use of antibiotics. URTI's are defined as "the presence of at least one of the following: viral cold, acute otitis media (AOM), maxillary sinusitis, pharyngitis, croup, acute bronchitis, pertussis, or pneumonia" (Altiner et al., 2012, p. 1).

Interpersonal sensitivity can include the act of accurately perceiving or restating in a tactful way what has been perceived. These skills vary from clinician to clinician and can include a variety of traits, including desires, feelings, intentions, truthfulness, needs, attitudes, personality, beliefs, physical states and values. Interpersonal sensitivity can be further divided into perceiving (noticing) and behavioral (performing the action, either verbal or non-verbal, as a result of one's perception or lack thereof). Interpersonal

sensitivity, for the sake of this project, plays a role in the clinician-patient relationship and in patient satisfaction (Hall, 2011).

Patient satisfaction can be measured on many facets to include caring, technical quality or provider skill level, accessibility, convenience, affordability, environmental cleanliness, and efficacy and outcomes. For this research patient satisfaction of efficacy and outcomes will be used and can be defined as care measured in terms of perceptions regarding the how helpful providers are with helping patients maintain or improve the status of their health (Ware, J., Davies-Avery, A., & Stewart, A. 1977). It is when this level of patient satisfaction is met that the patient feels they have received quality care.

Purpose Statement

The purpose of this project was to assess if nurse practitioners perceived patient satisfaction of patients seen in Metropolitan Retail Clinics was improved after educational materials were given to explain when antibiotics work. (See Appendix F)

Significance of Study

Antibiotic resistance in the United States is difficult to calculate, but ranges from $20 billion in healthcare costs to $35 billion in lost human productivity (CDC, 2013). This project will contribute to reducing the costs of healthcare by improving the use of antibiotics among providers. It will also benefit patient-provider communication by developing brief yet concise ways to elicit patient expectations, identify needs for education, and assist providers in allowing the patient to share in the role of decision making (Butler, Rollnick, Pill, Maggs-Rappoer, & Stott, 1998).

Project Relevance

Due to antibiotic resistance, it was necessary to evaluate the prudence of prescribing based on provider perception of patient satisfaction with the quality of care received during a medical visit when patients do not receive an antibiotic for an illness. It was necessary to understand the role that patients play in provider's practices of prescribing, and develop a strategy to reduce any inappropriate prescribing behavior (Bauchner et al., 1999). Attention was given to patient behavior and cues at the start of a visit and used to set a baseline to later detect changes following patient education and communication at the end of a health care visit. (See Appendix A & Appendix B)

Review of Literature

This section includes a comprehensive review of the literature that primarily covers a ten year period from 2003-2013. Special attention was paid to several articles prior to 2003 that included information pertinent to this study. This literature review uses the Matrix Method to examine the perceptions of providers whose patients were seen for an upper respiratory tract infection during a medical visit. For the sake of this project, the expectation of providers was measured by self-administered surveys or feedback that included questions about patient expectations during the medical visit, whether they were fulfilled, and whether the provider felt the patient was satisfied with the plan of care. A review of literature was performed using the search engines Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medline, and Google Scholar with key words upper respiratory tract infection, antibiotic, patient expectation, and quality of care, provider perception, and patient satisfaction. A review of abstracts was done for inclusion and exclusion criteria. The inclusion criteria required that the article include feedback

from providers, a patient visit for upper respiratory tract infection, be published in the last ten years, and be written in English. Four articles were excluded as they were not written in English. The key word perception was added to determine the providers perceived level of satisfaction and quality of care if no antibiotics were prescribed.

History of Antibiotic Resistance

According to the Microbiology and Molecular Biology Review, 2010, in the last 60 years what is known about antibiotic resistance has changed dramatically. Antimicrobials were first introduced in 1937, nine years after the discovery of penicillin. It was several years later that resistance began to plague its therapeutic use. Soon, antibiotic resistance to classes of medications which were the most therapeutic options for certain illnesses were greatly reduced. When methicillin was discovered and introduced into practice in 1959 it was supposed to defend against penicillin resistant organisms. However, methicillin-resistant staphylococcus aureus (MRSA) emerged three years later proving more antibiotic resistance. The mechanisms by which organisms are resistant to antibiotics continue to be studied extensively and are the basis for today's knowledge and research.

Health care providers have a history of prescribing habits that reveal great differences between geographic areas, higher volume practices, and number of years in clinical practice (Strandberg et al., 2013). While over prescribing of antibiotics has been a long standing problem, there are some reports that show a decreasing trend in the use of antimicrobials among children and adolescents. Despite this trending, the use of broad spectrum antibiotics steadily increased during the same time period (Ladd, 2005). The two main ideas that are presented in a study by Altiner et al. (2012) which increased

antibiotic prescribing include a lack of diagnostic certainty and inadequate provider-patient communication. When antibiotics are given as a result of diagnostic uncertainty, it provides reinforcement in the patients mind that antibiotics are needed for that or a similar illness in the future. Prior research shows that 51% of patients diagnosed with a cold, 52% diagnosed with URTI, and 66% diagnosed with bronchitis receive unwarranted antibiotics in their plan of care (Ladd, 2005).

A review of the literature revealed discussion related to over prescribing of antibiotics for URTI's, but did not differentiate whether this decision is based on practitioner perception of patient expectation or patient request. Mangione-Smith, R., Elliott, M., Stivers, T., McDonald, L., & Heritage, J.(2006) and Altiner et al. (2007) both stand out in the literature and encompass current research on provider perceptions of patient expectations for antibiotic treatment for URTI's. They share the results of prior research that shows a correlation that provider's perception of patient expectations is a strong indicator of prescribing behavior. However, results have proven that although providers perceive patient pressure, demands and requests from patients are infrequent. Therefore, research has been used to determine what communication behaviors patients use to cause these provider perceptions. It is not uncommon for providers to misinterpret the patients request to get well quickly or receive reassurance that they do not have a more serious illness, as a request for antibiotics. Regardless of these findings, the research concluded that practitioners express reluctance to following prescribing guidelines for URTI's, yet fail to ask questions about patient expectations during their medical visit (Mangion-Smith et al., 2006 & Altiner, et al., 2007).

Patient Expectation

"Patients perceived as expecting antibiotics may be seeking reassurance that they are not seriously ill or that they were correct to obtain medical care" (Stivers et al., 2003, p.140). According to Hudon et al. (2011), patient satisfaction is becoming the core value in family medicine and stands at the forefront as advanced practice nurses (APNs) seek to identify patient-centered care to gain greater compliance to medical advice. In this same study, by Hudon et al. (2011) forty two percent of practitioners perceive an expectation from patients (Watson et al., 1999). In this study an average of 14 percent of parents request an antibiotic and an average of 26 percent expect one. According to Stivers et al. (2003) and Mangione-Smith et al. (2006), verbal requests are not the only cue which influences provider perception while the conclusions of patient expectation indicate the need for additional research. For example when the patient supplies information suggesting a diagnosis and treatment for their illness, or the patient is resistant to a diagnosis of a viral nature, or the patient challenges the provider's level of decision making misperceptions often occur. However, there is a high level of patient satisfaction with education and communication along with increased satisfaction if a contingency plan to return in a few days if the patient was not doing better was offered (Stivers et al., 2003 & Mangione-Smith et al., 2006).

Advanced Practice Nurse Perception of Patient Pressure

Upper respiratory tract infection (URTI) is defined as "the presence of at least one of the following: viral cold, acute otitis media (AOM), maxillary sinusitis, pharyngitis, croup, acute bronchitis, pertussis, or pneumonia" (Altiner, 2012, p. 1) and they "are the most common reasons patients seek medical care" (Mangione-Smith et al., 2001, p. 800).

In multiple investigations, perceived patient pressure during these visits have shown an increase in overprescribing antibiotics (Mangione-Smith et al., 2001) and may be changing the dynamics of clinical outcomes. URTI's are usually self-limiting and do not require antibiotic treatment (Panagakou et al., 2011). It is necessary to understand patients influence on prescribing patterns and develop a strategy to reduce any inappropriate behavior (Bauchner et al., 1999) while maintaining or increasing satisfaction. To bridge this gap identified in the literature, it is the goal of this project to determine if the perception of the provider is based on the patient offering a diagnoses of bacterial origin, using a diagnoses of a close friend or family member, or practitioners concern with failing to meet patient expectations, leading to dissatisfaction with care and the loss of business (Mangione-Smith et al., 2001). Needless to say, decreasing unnecessary antibiotic prescribing is a complex, but a realistic task that will change patient communication habits for all healthcare providers (Altiner et al., 2007). It provides an avenue for open communication on the topic of antibiotics during the visit which can decrease the prescribing of antibiotics unless justified.

Health Programs to Change Prescribing

In one study overprescribing resulted in 97 percent of patients developing antibiotic resistance and 93 percent of providers writing prescriptions for URTI's (Watson et al., 1999). Roughly 90 percent of URTI's are caused by a viral illness, are self-limiting, and most patients will recover without antibiotic treatment (Bjerrum et al, 2011) community health actions must be taken to improve judicious use of antibiotics . The Institute for Clinical Systems Improvement [ICSI], 2013; Centers for Disease Control [CDC], 2013; World Health Organization [WHO] (Avorn et al. 2001); and

National Institute for Health and Clinical Excellence [NICE], 2008 all support evidence-based research to reduce the use of antibiotics for URTI's. The information reported by each of these entities included the natural occurrence and duration of the illness, written information on managing symptoms, and reassurance that additional antibiotics were not needed.

To promote judicious use of antibiotics and significantly reduce the 25 billion dollar direct and indirect costs for URTI's, the CDC launched the Appropriate Antibiotic Use in the Community program in 1995 and renamed it Get Smart: Know When Antibiotics work in 2003. This campaign focuses on patients and providers alike since attitudes and perceptions of both plays a key role in the prescribing and use of antibiotics. This program allows the provider to pay careful attention to patient discomfort while providing alternative solutions and exhibiting antibiotic stewardship. This information is shared with healthcare providers in different practice settings to establish principles for the use of antibiotics.

Barriers

The Avorn et al., (2001) listed a number of barriers consistent with and encompassing the findings of this literature review. These barriers present challenges to healthcare providers which include defensive medicine in an effort to divert litigation, prescribing antibiotics when visit time is limited in an effort to end the visit more quickly, lack of financial support to educate both healthcare professionals and the general public, commercial pressure from manufacturers to use antibiotics for an illness, education sessions that reinforce the message of antibiotic overuse; supervision and the monitoring

of prescriber feedback, and lastly providing audit feedback on provider prescribing habits.

Theoretical Framework

The foundation of this project was built on Kurt Lewin's theoretical three-step model of change according to Lewin, 1947. Lewin's unfreezing-change-refreezing model lends itself to changes in clinical practice and has been used in nursing research for many years. As project objectives were met, Lewin's model was used as a guide to successfully achieve program outcomes. As practitioners prescribing habits were evaluated, according to evidence based guidelines of prudence, this theoretical framework became instrumental. Practitioners were involved in the program in an effort to include them in ownership of change. Plan, process, and feedback from these practitioners was elicited to successfully achieve behavioral unfreezing or Lewin's first step of the process.

As providers change, or step two of the process, the theoretical framework helped the primary investigator share patient education tools with providers. These tools included evidence based information for providers to share with the patients and integrate into every visit to explain the appropriate use of antibiotics. The questions and feedback helped change healthcare visits from practitioner focused care to provider care with patient input on treatment plans. The lack of responses made it impossible to determine if patients felt heard and as a result were more satisfied with plan of care to increase overall perception of satisfaction and quality of care received.

Once provider change was proven through research and clinical evaluation, the program moved into the refreezing or third step of Lewin's process. It was during this

process that all positive changes that increase patient's knowledge regarding appropriate use of antibiotics for upper respiratory illness thus increasing satisfaction with plan of care was shared with other providers. The new clinical practice will become the standard of care which is when refreezing will occur.

Feedback from the providers helped determine if a pilot of the program could be expanded to a larger area of intervention. The program developer used the results to make decisions on resource allocation. Retail health administrators granted permission to expand the intervention area, whether funding will be granted by the enterprise, and if the program is running as expected.

Project

This project assessed the perception of providers related to prescribing of antibiotics and patient satisfaction. Providers with less than one year of clinical experience were excluded as these providers were new to clinical practice and the scope of service provided by retail health. Patients with ongoing respiratory issues that were seen within 14 days of participation in this study were also excluded. This project included the independent variable of patient education and the dependent variable of provider perception both before and after patient education was provided. A questionnaire elicited the feedback needed to draw conclusions based on provider responses in a systematic way. After information was gathered, the assessment of provider perception was be used to determine if educating patients with the CDC document, *Know When Antibiotics Work* improved communication and patient understanding of antibiotics. The providers involved in the program, during their

everyday care, were positioned to reeducate patients either through their own practice or a community health campaign. Providers must culturally learn to communicate findings in a way that create balance between provider perception and patient expectation (Bauchner et al., 1999).The inputs and resources needed to conduct this project included questionnaires to gather data from providers (including APRNs) to educate other providers, as well providers to educate patients. Retail healthcare administrators and committee members were used to increase the likelihood of a quality project and serve as a catalyst to move this project forward. The final result was to include a reproducible project that was reflective of evidence-based practice for reference by other clinicians at the end of the project.

Methods

Fifteen questionnaires that include five pre and four post patient education questions that measure interpersonal sensitivity and provider perception were given to each provider. Fifty percent of these providers (Group A) used questionnaire A, which includes a patient education intervention that enhances patient-provider communication. Patient education included the review of CDC form Get Smart: Know When Antibiotics Work. When the provider made the clinical decision not to treat the patient with an antibiotic for URTI and perceived that the patient was not satisfied with this decision, patient education was given. The provider identified to the patient the row on the education document consistent with the patient's illness. If symptoms were listed below the illness, the provider reviewed those symptoms that are consistent with the patient's symptoms. The provider then moved to the next column that identified the usual cause of the illness, viral or bacterial, and shared this with the patient. After reviewing the

document the provider gave the patient an opportunity to ask questions. Following the departure of the patient from the exam room, a questionnaire for that patient was completed and inserted into an envelope to be collected at the end of the data collection period by the primary investigator.

Fifteen questionnaires that include five pre and one post patient education question that measure interpersonal sensitivity and provider perception was used for the comparison group. This group of providers who represent the other fifty percent (Group B), the comparison group, used questionnaire B which included the standard of care as identified in the retail health setting. Questionnaire B is the same as questionnaire A with the exclusion of three post education questions. These eliminated questions review the effectiveness of the patient education used, if the patient agrees with the provider post education, and if the patient used terms of agreement while education is being given.

Approval was obtained to survey providers from the UMSL Institutional Review Board. Providers were selected to pilot this qualitative cross-sectional research project, provide patient-provider communication techniques, and share feedback regarding the questionnaire used to collect supporting data of the providers perception of this medical visit. Bauchner et al. (1999) stated that changing the behavior of providers is complex, but is needed to reduce inappropriate prescribing and open patient-provider communication.

The legal team in retail healthcare was consulted and healthcare providers were chosen to participate in this project. This project included two groups of providers, one group that provided the standard of care as defined by evidence based practice in the

retail health setting. The other group received education and patient intervention education that was integrated seamlessly in to standard of care previously mentioned. The project director will provide both groups of providers with a fifteen minute informational session about the program. However, the intervention group received an additional forty-five minute session that included specific directions for clinicians to provide patient education regarding when antibiotics work. The metropolitan retail health setting was identified for research and included providers with a minimum of one year clinical experience. (See Appendix H)

Stakeholders

The stakeholders in this project were providers, patients, the program director, and the retail healthcare leaders. Moreover, understanding the why behind care provided helped patients own their healthcare and further remove the idea that healthcare is the sole responsibility of the healthcare provider. Patient perception was important, but did not dictate care. It carefully guided the content of the conversation shared between provider and patient. During this conversation, health care providers identified gaps in patient education and provided feedback to maintain patient satisfaction and decrease the need for a return visit when clinical care did not meet the patient's expectations the first time.

This project involved stakeholders through regular meetings of information sharing. A pre and post survey measured provider perception and attempted to accomplish program results to evaluate both process and outcome. When final results were collected, these same engaged stakeholders were encouraged to expand the

evaluation process across a practice or entire health system. The results of expanding the program ensured an adequate sample size to produce statistical significance.

Outcomes

Data analysis did not revealed that provider perceived patient satisfaction improved as a result of patient education related to illness and appropriate use of antibiotics. Provider knowledge regarding patient expectation was established as baseline expectations were initially identified during the visit followed by a rationale regarding a need for the patient to change their expectation. Patient-provider communication allowed the patient to have their questions answered during a medical visit (Fischer, T., Fischer, S., Himmel, W., Kochen, M., & Hummers-Pradier, E. 2008). This project's outcomes were used to determine if there was statistical significance in this cross-sectional research study. After the project was complete the post exam surveys were used to evaluate repeated measures t-tests. Information was shared with stakeholders, participating providers, and colleagues about the program activities, outcomes, and to perform a complete review of evaluation findings in order to make education changes. A time for the meeting to review the complete results was scheduled. Findings were reviewed to determine what caused the outcomes and what practice changes or provider education improvements needed to be made to promote patient satisfaction during medical visits. These strategies were executed in a clear and concise manner, through program mapping to prevent ambiguity and reduce the likelihood that information was misinterpreted. Routine scheduled communication ensured that stakeholders were available through prior scheduling for purposes of implementation. During this time, lessons learned were shared with stakeholders.

Data Analysis & Results

During the development of this project, it was determined that a two-factor Analysis of Variance (ANOVA) would be used to report the results. This test would isolate the variables being studied to decrease the risk of distortion between the groups being studied. The two-factor ANOVA would evaluate the difference between Group A, who receives the standard of care plus an intervention of patient education and Group B who receives the standard of care as defined by the retail healthcare settings. Due to a lack of responses, post standard of care for the control group, it took away the possibility of including posttest data for the control group and being able to run a two way ANOVA. The pretest and posttest were then changed and analyzed with a one group pretest – posttest design with focus on the intervention group. Data were presented as mean and standard deviation using a Paired Samples *t* Test. (See Table 1)

Table 1: Pre & Post Intervention Likert Responses

	Strongly Agree	Agree	Uncertain	Disagree	Strongly disagree	No Response
Pre Intervention: Time 1	4	3	2	1	0	
Post Intervention: Time 2	4	3	2	1	0	

After careful analysis of the data, it was determined that the paired-samples t-test would be effective. A paired-samples t-test was explored on the intervention group as responses to the pre-test and post-test question were compared. These results, determined using criteria for significance of $p < .05$, compared initial mean of the pretest question to

the posttest question of the intervention group. This test was found to be not statistically significant, t(54) = -1.590, p= .118, which indicates that while a change was present it cannot be interpreted that the intervention caused this change on pre and post questions at Time 1 (M=2.3091, SD=1.19989) at Time 2(M=2.7273, SD=.98985).

Human Subject Protection

Prior to the start of this research project approval was obtained through Expedited Review from the Institutional Review Board (IRB) at the University of Missouri St. Louis (UMSL) in electronic form. Following approval, participants reviewed a hard copy of the consent, alternatives to participation, risks, benefits, and the questionnaire specific to their study group A or B. These questionnaires did not contain identifying information or data of the provider who completed it nor the patient who received the education or intervention.

Challenges

There were several biases that existed for this program. Four clinics were used for the evaluation of this program and the geographic locations may have been generalized to different backgrounds and populations. Another bias was the small female nurse practitioner sample used in this program which under-represented male providers. Lastly the presence of the Hawthorne Effect may have produced unexpected results as providers knew they are being evaluated in the study.

Challenges to this project included a small sample of patients seen only in the retail health setting. Patients may not have been truthful with the evaluating provider regarding their symptoms in an attempt to received antibiotics. Each provider may not

have educated patients or completed the questionnaire in the same manner. Clinician's may have chosen to stop using the CDC *Get Smart: Know When Antibiotics Work* document and returned to their old practice habits after the project ended. The patient may have agreed with the provider during the visit, and file a complaint after leaving the clinic in an attempt to avoid further patient-provider communication? The collection of data lasted one week which decreased the time participating providers had to discuss their questions and concerns about the project. One provider opted out of participation which decreased provider participation and that gathering of patient perception for the overall study. Lastly, research began post cold and flu season and the number of questionnaires desired was not captured in the allotted time period to measure the statistical significance as previously intended. The maximum number of questionnaires that were completed per provider was reduced from thirty to fifteen.

Application to Practice

Additional research regarding provider perception is needed, but nurse practitioners within the study used the results for short term goals to provide feedback to the project director regarding their thoughts, perceptions, and interpretations of the questions selected on the survey from patient feedback. The project director used these evaluation results to substantiate the need for the program and ensure that activities in the project are appropriate. The questionnaire can be used by APRNs and other providers in the future to decrease the use antibiotics when treating URTIs. Retail health administrators will use the results to determine if program activities are cost effective to the company and to determine if the results are beneficial to the enterprise.

Research Question

Will provider perception of patient satisfaction decrease unnecessary prescribing of antibiotics after providing patient education?

Instrumentation

The Patient Satisfaction Questionnaire Form (PSQ-18) is a tool tested in multiple healthcare settings and through extensive research maintains reliability and internal consistency. The validity of this tool was assessed through reassurance that goals and objectives were clearly defined. The PSQ-18 was tailored to create the questionnaire used for this project (Thayaparan & Mahdi, 2013). (See Appendix C)

Essentials to DNP Practice

The American Academy of Colleges of Nurses has established elements and competencies that must be met to ensure that DNP programs achieve foundation competencies that allow nurses to practice in the role of Doctor of Nursing Practice. DNP Essential I – Scientific Underpinnings for Practice, was used by the primary investigator in this project to identify the significance of antibiotic resistance and its impact on healthcare. The identification of the patient's role in inappropriate antibiotics was significant to understand their influences on prescribing habits of APRNs. With research and evaluation, the utilization of an existing document created by the CDC to educate patients to improve the judicious use of antibiotics among patients was used. DNP Essential II – Organizational and Systems Leadership for Quality Improvement and Systems Thinking, was met through the identification of a patient culture that believes most UTRIs are treated with antibiotics. APRN's participating in this project was

positioned to improve the quality of patient outcomes and health promotion. The incorporation of a CDC evidence based document was needed to deliver quality education to a diverse population without disruption to their environment. DNP Essential III - Clinical Scholarship and Analytical Methods for Evidence-Based Practice, was met as this project evaluation was used to produce meaningful research based outcomes through evidence based practice. It was used in combination with the standard of care to improve clinical practice in a scholarly manner. DNP Essential VI – Interprofessional Collaboration for Improving Patient Population Health Outcomes, was exhibited by the leadership skills of the primary investigator to implement patient education to improve patient adherence, patient-provider communication, and patient satisfaction. During the data collection, an inter-professional team was led by the primary investigator to impact healthcare. DNP Essential VIII – Advanced Nursing Practice, was met on multiple levels. The primary investigator assessed the complexity of antibiotic resistance as a national healthcare issue, reviewed the patient's role in inappropriate prescribing, and provider perception of patient expectations if antibiotics are not given for a URTI. This project designed and implemented an evidence based intervention to promote judicious use of antibiotics. The findings of this project were used to determine if provider practice changes were needed and patient-provider communication were improved during a healthcare visit.

Conclusion

The evaluation of provider perception of patient satisfaction remains necessary to ensure that antibiotics are used for illnesses they are designed to treat (Hudon et al., 2011). These practices prevent new drug resistance and keep current antibiotics resistance

from spreading (CDC, 2010) and changes patient perspectives through education that antibiotics are unlike to change the course or outcome of the infection (Altiner et al., 2012). Patients play a key role in antibiotic prescribing through their demands, requests, or actions.

This project was originally designed to assess if nurse practitioners perceived patient satisfaction of patients seen in the metropolitan retail clinics was improved after education material was given. A lack of posttest responses by providers in the control group, Group B, made this assessment unable to be determined. This test was found to be not statistically significant, which indicates that while a change was present it cannot be interpreted that the intervention caused this change on pre and post questions The findings suggest that there is no statistical significance in providing patient education as evidenced by pretest – posttest comparison of the intervention group. This project demonstrates that DNP prepared nurses are capable of gathering evidence-based research and can effectively use it to make practice changes that challenge healthcare policy. If this project were repeated by the investigator, it would be recommended that a larger sample size be used, the project occur during cold and flu season, and that providers indicate whether there is a change in provider perception of patient satisfaction following the standard of care among the control group.

References

Altiner, A., Berner, R., Diener, A., Feldmeier, G., Kochling, A., Loffler, C., Schroder, H., Siegel, A., Wollny, A., Winfried, V. K. (2012). Converting habits of antibiotic prescribing for respiratory tract infections in German primary care – the cluster – randomized controlled CHANGE – 2 trial. *BioMed Central Family Practice*, 13(124), 1-7.

Altiner, A., Brockman, S., Sielk, M., Wilm, S., Wegscheider, K., & Abholz, H. (2007). Reducing antibiotic prescriptions for acute cough by motiving GP's to change their attitudes to communication and empowering patients: a cluster randomized intervention study. *Journal of Antimicrobial Chemotherapy*, 60, 638-644. Doi:10.1093/jac/dkm254

Avorn, J., Barrett, J., Davey, P., McEwen, S., O'Brien, T., & Levy, S. (2001). Antibiotic resistance: synthesis of recommendations by expert policy groups. Alliance for the prudent use of antibiotics. Retrieved from http://www.WHO/CDS/CSR/DRS/2001.10

Bauchner, H., Pelton, S., & Klein, J. (1999). Parents, physicians, antibiotic use. *Pediatrics*, 103, 395-401.

Bjerrum, L., Munck, A., Gahrn, Hansen, B., Hansen, M., Jarbol, D. E., Cordoba, G., Llor, C., Cots, J.M., Hernandez, S., Lopez-Valcarcel, B. G., Perez, A., Cabellera, L., Von der Heyde, W., Radzeviciene, R., Stichele, V., Benko, R., Palcevski, V. V., Lionis, C., & Ronning, M. (2011). Health alliance for prudent antibiotic

prescribing in patients with respiratory tract infections (happy audit) – impact of a non-randomized multifaceted intervention program. *BioMed Central,* 12(52), 1-8.

Butler, C. C., Rollnick, S., Pill, R., Maggs-Rappoer, F., &Stott, N. (1998). Understanding the culture of prescribing: qualitative study of general practitioners and patients perceptions of antibiotics for sore throat. *British Medical Journal,* 317(7159), 637-642.

Fischer, T., Fischer, S., Himmel, W., Kochen, M., & Hummers-Pradier, E. (2008). Family practitioners diagnostic decision-making processes regarding pateints with respiratory tract infections: an observational study. *Medical Decision Making,* 28(810), 810-818. Doi: 10.1177/0272989X08315254

Hall, J. A. (2011). Clinicians' accuracy in perceiving patients: its relevance for clinical practice and a narrative review of methods and correlates. *Patient Education and Counseling*, 84, 319-324. Doi:org/10.1016/j.pec.2011.03.006

Hudon, C., Fortin, M., Haggerty, J.L., Lambert, M., & Poitras, M. (2011). Measuring patients' perceptions of patient-centered care: a systematic review of tools for family medicine. *Annals of Family Medicine*, 9, 155-164. Doi:10.1370/afm.1226

Institute for Clinical Systems Improvement. (2013). Diagnosis and treatment of respiratory illness in children and adults. Retrieved from https://www.icsi.org/guidelines__more/catalog_guidelines_and_more/catalog_guidelines/catalog_respiratory_guidelines/respiratory_illness/

Kravitz, R. L. (2001). Measuring patients' expectations and requests. *Annals of Internal Medicine,* 134(9), 881-888.

Ladd, E. (2005).The use of antibiotics for viral upper respiratory tract infections: an analysis of nurse practitioner and physician prescribing practices in ambulatory care, 1997-2001. *Research*, 17(10), 416-424.

Lewin, K. (1947). Frontiers in group dynamics: concept, method, and reality in social sciences; social equilibria and social change. *Human Relations,* 1:5. Doi:10.1177/001872674700100103

Little, P., Dorward, M., Warner, G., Stephens, K., Senior, J., & Moore, M. (2004). Importance of patient pressure and perceived pressure and perceived medical need for investigations, referral, and prescribing in primary care: nested observational study. *British Medical Journal 1-4 doi:10.1136/bmj.38013.644086.7C*

Mangione-Smith, R., Elliott, M., Stivers, T., McDonald, L. L., & Heritage, J. (2006). Ruling out the need for antibiotics. *Arch Pediatric Adolescent Medicine,* 160, 945-952.

Mangione-Smith, R., McGlynn, E., Elliott, M., McDonald, L., Franz, C., & Kravitz, R. (2001). Parent expectations for antibiotics, physician-parent communication, and satisfaction. *Arch Pediatric Adolescent Medicine,* 155, 800-806.

McCaig, L., Besser, R., Hughes, J. (2003). Antimicrobial drug prescription in ambulatory care setting in the united states.

Panagakou, S., Spyridis, N., Papaevangelou, V., Theodoridou, K., Goutziana, G., … Hadjichristodoulou, C. (2011). Antibiotic use for upper respiratory tract infections in children: a cross sectional survey of knowledge, attitudes, and practices (KAP) of parents in greece. *Pediatrics,* 11, 1-10.Roumie, C. L., Halasa, N. B., Grijalva, C. G., Edwards, K. M., Zhu, Y., Dittus, R. S., & Griffin, M. R. (2005). Trends in antibiotic prescribing for adults in the united states – 1995 to 2002. The Journal of General Internal Medicine, 20, 697-702. Doi:10.1111/j.1525-1497.2005.0148.x

Stivers, T., Mangione-Smith, R., Elliott, M., McDonald, L., & Heritage, J. (2003). Why do physicians think parents expect antibiotics? What parents report vs what physicians believe. *The Journal of Family Practice,* 52(2)140-148.

Strandberg, E. L., Brorsson, A., Hagstam, C., Troein, M., & Hedin, K. (2013). "I'm dr jekyll and mr hyde": are gp's antibiotic prescribing patterns contextually dependent? A qualitative focus group study. *Scandinavian Journal of Primary Health Care*, 31:158-165. Doi:10.3109/02813432.2013.824156

Thayaparan, A. J., & Mahdi, E. (2013). "The patient satisfaction questionnaire short form (psq-18) as an adaptable, reliable, and validated tool for use in various settings. *Medical Education Online, 1-2. Doi:10.3402/meo.v18io.21747*

U.S. Centers for Disease Control and Prevention. (2010). Antibiotic resistance questions and answers. Retrieved from http://www.cdc.gov/getsmart/antibiotic-use/antibiotic-resistance-faqs.html#define-antibiotics

U.S. Centers for Disease Control and Prevention. (2013). Antibiotic resistance threats in the united states. Retrieved from http://www.cdc.gov/drugresistance/threat-report-2013

U.S. Department of Health and Human Services, National Institute for Health and Clinical Excellence. (2008). Respiratory tract infections: antibiotic prescribing. Retrieved from http://www.nice.org.uk/CG069

Ware, J., Davies-Avery, A., Stewart, A. (1977). The measurement and meaning of patient satisfaction: a review of the literature. *Health and Medical Care Services Review.*

Watson, R., Dowell, S., Jayaraman, M., Keyserling, H., Kolczak, M., & Schwartz, B. (1999). Antimicrobial use for pediatric upper respiratory infections: reported practice, actual practice, and parent's beliefs. *Pediatrics,* 108, 591-596.

Provider Perception

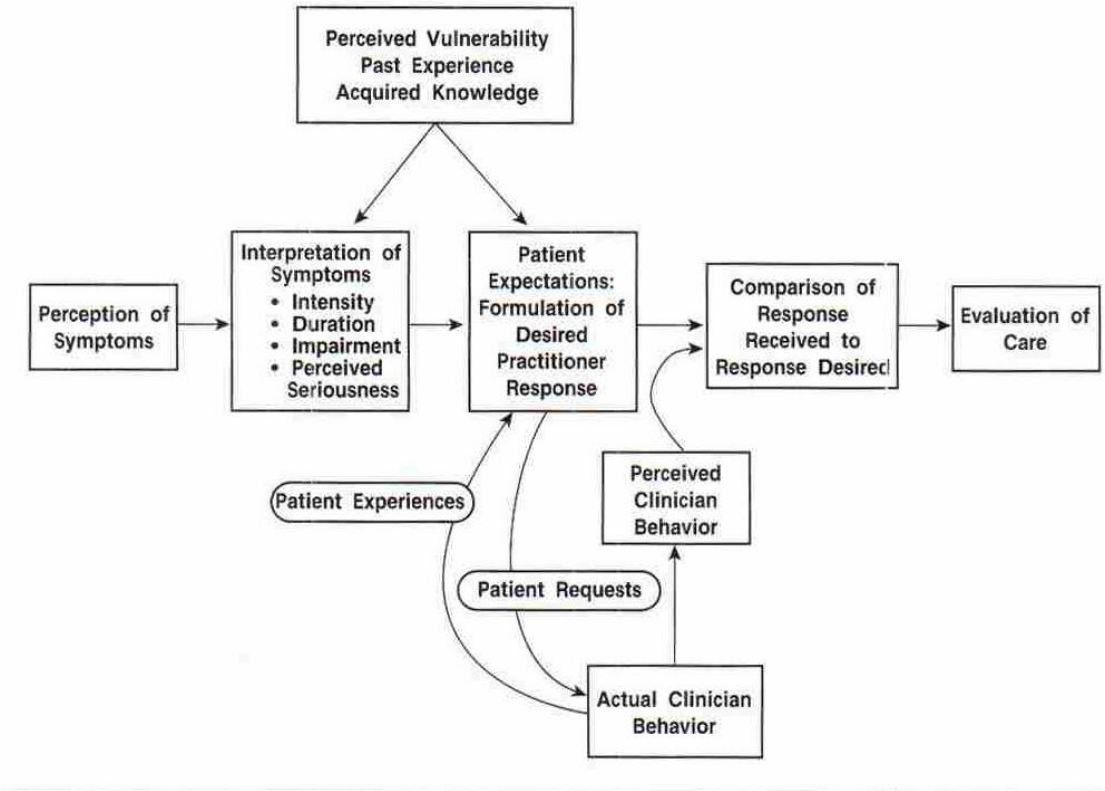
Appendix A: Logic Model

Indicators for this program will be determined first by the success of short-term goals. Several of these goals included whether providers remained in the program, whether the post-tests were completed, and whether what is written on the survey was asked in the specific survey questions. All of these activities will help the program director determine if the program is running properly.

LOGIC MODEL			
Inputs/Resources	Activities	Outputs	Outcomes
Survey	Providing input and feedback	# of Surveys Administered	Understanding pt perception
Providers	Provider Training	# of Practices Involved	Prudent Provider Prescribing
Patients	Seen for URTI	Demanding or requesting antibiotics	Patient Understanding Increased
Committee Members	Building Relationships	NP that gave input	Organized Project
Project	Gathering Data	# of surveys with additional feedback added	Publication for Stakeholders
Project Funding	Applying For Grants	# of Grants Requested	Funding For Project
			Impact on Healthcare
			Decrease Antibiotic Resistance
			Increased Health Promotion
			Decreased Side Effects
			Patient Satisfaction

Appendix B

Conceptual Model Relating patient symptoms, expectations, and evaluations



Kravitz, 2001 – The Physician Patient Relationship

Appendix C – Questionnaire A

Provider Perception Pre & Post Patient Education						
Statement	**Strongly Agree**	**Agree**	**Uncertain**	**Disagree**	**Strongly Disagree**	**No Answer**
The patient presented the problem by listing (verbally listing) stating "symptoms only" or (nonverbal listing) actively coughing, throat clearing, wiping nose?						
The patient presented the problem by suggesting or implying their diagnoses or the recent diagnoses of a close family member or friend with the same symptoms?						
The patient verbalized being seen for this illness before and antibiotics were given, the provider perceives that the patient means future occurrences of this illness must be treated with an antibiotic?						
A diagnosis is made and the patient questions treatment or states preferences for treatment which are different than the providers recommendations?						
The Provider perceives that the patient is not satisfied with this recommendation or the patient clearly states it?						
Patient Education Provided						
The explanation of patient education documents helped facilitate rational use of antibiotics for this patient based on provider perception.						
The patient now agrees with the provider's recommendations and treatment plan?						
The patient used terms of agreement and understanding (umm hum, ok, leaning forward, and smiling) during the explanation of patient education documents?						
The providers perceived patient satisfaction changed after patient education (intervention) was given.						

Thayaparan, A. J., & Mahdi, E. (2013). PSQ-18

Appendix D – Questionnaire B

Provider Perceptions With Standard of Care						
Statement	**Strongly Agree**	**Agree**	**Uncertain**	**Disagree**	**Strongly Disagree**	**No Answer**
The patient presented the problem by listing (verbally listing) stating "symptoms only" or (nonverbal listing) actively coughing, throat clearing, wiping nose?						
The patient presented the problem by suggesting or implying their diagnoses or the recent diagnoses of a close family member or friend with the same symptoms?						
The patient verbalized being seen for this illness before and antibiotics were given, the provider perceives that the patient means future occurrences of this illness must be treated with an antibiotic?						
A diagnosis is made and the patient questions treatment or states preferences for treatment which are different than the providers recommendations?						
The Provider perceives that the patient is not satisfied with this recommendation or the patient clearly states it?						
Patient Education Provided/Patient Education Not Provided						
The providers perceived patient satisfaction changed after patient education (intervention) was given.						

Thayaparan, A. J., & Mahdi, E. (2013). PSQ-18

Appendix E

Proposal Timeline	
Month	**Action**
September 2013	D1 and D2 Forms submitted to the graduate school
February 2014	Submit proposal to committee members
February 2014	Oral Defense of proposal to committee members
May 2014	Obtain approval from the Metropolitan Retail Health Center
June 2014	Obtain approval from the University of Missouri St. Louis
June 2014	Enrollment of study providers into the program
June 2014	Analysis of data collection
June - July 2014	Prepare results report

Appendix F

Get Smart. Take a look at this chart to find out which upper respiratory infections are usually caused by viruses — germs that are not killed by antibiotics. Talk with your doctor about ways to feel better when you are sick. Ask what you should look for at home that might mean you are developing another infection for which antibiotics might be appropriate.

Illness	Usual Cause		Antibiotic Needed
	Virus	Bacteria	
Cold	✔	☐	No
Flu	✔	☐	No
Chest Cold (in otherwise healthy children and adults)	✔	☐	No
Sore Throats (except strep)	✔	☐	No
Bronchitis (in otherwise healthy children and adults)	✔	☐	No
Runny Nose (with green or yellow mucus)	✔	☐	No
Fluid in the Middle Ear (otitis media with effusion)	✔	☐	No

Appendix G

Informed Consent for Participation in Research Activities

Provider Perception of Patient Satisfaction Whether or Not Antibiotics Are Given

Participant_____ HSC Approval Number _579679-2_____

Principal Investigator Robyn Doniel Drake PI's Phone Number 314-574-5756

Nurse Practitioner:

1. You are invited to participate in a research project conducted by Robyn Doniel Drake, Family Nurse Practitioner. The purpose of this project is to evaluate provider perception of patient satisfaction whether or not an antibiotic is prescribed.

2. a. Your participation will involve completing a yes or no questionnaire to help the principal investigator understand the current perception of providers when patients present for an upper respiratory infection and provide cues or requests for antibiotics. It will include if provider perception of patient satisfaction is changed following patient education. This questionnaire will remain anonymous and no identifiers will be used to trace the questionnaire back to the provider. This questionnaire will be completed over a 4 week period or 30 provider questionnaires, whichever comes first. The Principal Investigator will come to the participant's office or meeting area to facilitate participation in all aspects of this project.

   b. Once completed, all questionnaires will be picked up by the primary investigator and reviewed for evaluation outcomes.

   Approximately 180 questionnaires will be involved in this project at the University of Missouri St. Louis.

   c. The amount of time involved in your participation will be 15 minutes project training session for the control group and 20 minute project training sessions for the intervention group to include patient education. Each survey will be integrated seamlessly into the patient visit.

3. There are no known risks associated with this project.

4. The possible benefits to you from this project are improved knowledge of current provider perception of patient satisfaction whether or not an antibiotic is given and if evidence based patient education is sufficient if provided during the visit to increase satisfaction.

5. You participation is voluntary and you may choose not to participate in this project or withdraw your consent at any time. You will NOT be penalized in any way should you choose not to participate or withdraw.

6. The primary investigator will do everything she can to protect your privacy. As part of this effort, your identity will not be revealed in any publication that may result from this project. In rare instances, a project must undergo an audit or program evaluation by oversight agency (Such as the Office for Human Research Protection) that would lead to disclosure of your data as well as any other infection collected by the primary investigator.

7. If you have any questions or concerns regarding this project, or if any problems arise, you may call the Primary Investigator, Robyn Doniel Drake at 314-574-5756. You may also ask questions or state concerns regarding your rights as a project participant to the Office of Research, at 314-516-5899.

_____ _____

Participants Signature Date

_____ _____

Signature of Investigator or Designee Date

APPENDIX H:

Process of Provider Education