PATIENT'S IMPACT ON ANTIBIOTICS PRESCRIPTION FOR VIRAL INFECTIONS

by

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Abstract

The purpose of this project is to evaluate the effectiveness of a patient educational intervention on the rates of desire for antibiotics for viral upper respiratory infections. A quasi-experimental design with a convenience sample of patients that was presented to the clinic between August and September 2015 was used. A questionnaire adapted from a similar study, modified to fit the patient population, was administered as a pretest and posttest. For the intervention, the participants read a brochure by the Centers for Disease Control and Prevention (CDC) that explains the difference between bacteria and viruses, as well as antibiotic resistance. It also explains when antibiotics are and are not appropriate. This project supports the claim that educational intervention can help reduce a patient's desire for antibiotics for viral upper respiratory infections. Future research should consider if the perception of providers regarding whether a patient is expecting antibiotics influences their prescription of antibiotics.

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Viral upper respiratory infections (VURIs) are one of the leading reasons for a patient's visit to ambulatory healthcare facilities such as urgent cares and emergency rooms (Robert, 2015). The continuous prescription of antibiotics for management of these VURIs has been noted despite the many guidelines available to prevent this. However, the recent emergence of antibiotics resistance resulting from the inappropriate use and prescription of antibiotics has brought attention to this problem. The increasing difficulty of managing bacterial infections due to antibiotics resistance, indicating that standard treatments are no longer effective, has been identified as a significant threat to the healthcare system globally (Centers for Disease Control and Prevention, 2014; Reardon, 2014; World Health Organization, 2014). Effects of antibiotic resistance include increased risk of infections, economic and social costs due to prolonged hospital stays, and risk of death (World Health Organization, 2014). While many reasons have been identified as possible causes of inappropriate antibiotics prescription, the patient's expectation and pressure were noted to be the major reasons for providers prescribing antibiotics for VURIs (Reardon, 2014; Stokowski, 2010).

Background

Upper respiratory infections (URIs) affect the nose, sinuses, pharynx, trachea, and bronchi. Most URIs are caused by viruses such as rhinovirus, coronavirus, adenovirus, and respiratory syncytial virus. Despite this, antibiotics are continuously being prescribed for these viral infections. One reason why antibiotics are being prescribed for VURIs is to increase patients' satisfaction (Stearns, Gonzales, Camargo, Maselli, & Metlay, 2009). Research has shown that when providers believe that patients expect antibiotics treatment, they write the prescription to satisfy them. Wong, Blumberg, and Lowe (2006) noted that up to half of the parents who presented to a clinic with their children with complaints of VURIs expected to receive antibiotics for their children. They also noted that approximately one-third of the physicians assumed that the parents were expecting to be prescribed an antibiotic for that visit (Wong et al., 2006). These patients' expectations, providers' assumptions, and limited office visit time for physicians might make

prescribing an antibiotic preferable to spending extra time to explain why antibiotics are not recommended for viral infections.

Rationale for Project

Even though several guidelines have been published to help eradicate the inappropriate prescriptions of antibiotics, 25-50% of antibiotics prescriptions are still unnecessary (Hooton & Levy, 2001). Consequences resulting from prescribing antibiotics when not needed, or from the prescription of a broad-spectrum antibiotic when a narrower agent is deemed effective, are manifold (Hersh, Shapiro, Pavia, & Shah, 2011). Prescribing antibiotics in such cases contributes not only to the increased risk of antimicrobial resistance, but also leads to avoidable adverse health events and unnecessary healthcare costs (Hersh et al., 2011). Antibiotic resistance stemming from inappropriate use of antibiotics is an economic burden on the entire healthcare system because resistant infections cost more to treat and can prolong healthcare use (Centers for Disease Control and Prevention, 2014).

According to the Centers for Disease Control (2011) (CDC hereafter), the rise of antibiotic resistance has grown significantly and now poses a worldwide threat. The CDC (2014) noted that over two million people are diagnosed with bacterial infections resistant to antibiotics every year, and at least 23,000 die from these infections and even more from antibiotics-related complications. Most of these drug-resistant infections could have been prevented, and contrary to common belief, antibiotics do not reduce the risk of serious complications associated with viral upper respiratory infections (Petersen et al., 2007).

Purpose of the Project

The influence of patient or parent expectation on physician's behavior is significant, and therefore, offers a target for intervention to reduce the injudicious prescription of antibiotics as a means of preventing the emergence of antibiotic-resistant bacteria. While many reasons have been identified as a possible cause for the inappropriate antibiotics prescription, patient expectation and pressure were noted to be the major reasons why providers prescribe antibiotics for VURIs (Reardon, 2014; Stokowski, 2010). These findings also demonstrate responsiveness by physicians to the wishes of their patients and suggest that a change in

patient expectation may result in a change of antibiotic prescription rates. The purpose of this project, therefore, is to evaluate the effectiveness of an educational intervention in reducing a patient's desire for antibiotics for viral upper respiratory infections.

Summary of Literature Review

Even though it is widely known and evidentially-supported that antibiotics are ineffective for the management of viral infections, antibiotics are still being prescribed for viral infections. Patient expectation for antibiotics has been recognized as one of the reasons why providers are being pressured to prescribe antibiotics inappropriately. A study conducted to explore the impact of parental influence on physician's antibiotics prescription rate for viral infections showed that more than half of the physicians reported that they were influenced by the parental desire for antibiotics (Zolaly & Hanafi, 2011). Stokowski (2010), in agreement with this, also stated that providers can save significant productivity time by prescribing an antibiotic instead of spending extra time trying to educate a patient that antibiotics are ineffective for viral infections; hence, providers sometimes give in to patient pressure.

There is significant pressure on providers, especially in the primary and secondary care setting, to speed up productivity. Some providers believe that spending time to reassure patients that antibiotics are not needed for viral infections, instead of just prescribing antibiotics, prolongs office visits (Butler, Rollnick, Pill, Maggs-Rapport, & Stott, 1998). In Butler et al.'s (1998) study, a provider said, "you spend 15 min trying to educate them, when they will go out disillusioned, come back the next day and see someone else, making you feel 5 minutes would be better spent just giving them a prescription and getting rid of them" (p. 639). Friedman, Schwabe-Warf, and Goldman (2011) also noted in their survey of over 600 practicing physicians that parents of sick children that were presented and diagnosed with viral infections asked 96% of these pediatricians for antibiotics. Therefore, they suggested that implementing patient-focused educational intervention can reduce the pressure on doctors to prescribe antibiotics inappropriately (Friedman et al., 2011).

Evidence has shown that patient educational intervention regarding the appropriate use and prescription of antibiotics has led to a significant reduction in the misuse of antibiotics because patients' request for antibiotics was identified as one of the reasons why providers prescribe antibiotics inappropriately. Different interventions were utilized by all of the studies reviewed; however, they all concluded that educational intervention, especially those involving patients, leads to significant reduction in the prescription of antibiotics for viral upper respiratory infections (Butler et al., 2012; Gonzales, Steiner, Maselli, & Lum, 2001; Gonzales, Steiner, Lum, & Barrett, 1999; Vinnard et al., 2013). All articles identified patient pressure and persistence as the major reasons why clinicians prescribe antibiotics inappropriately. Hence, this is the reason why improvement in the prescription of antibiotics is not noted in studies in which patient interventions were not included. Therefore, implementing patient educational programs can affect and help reduce patient's pressures on providers to prescribe antibiotics.

The review of literature corresponds and relates to the clinical question because patient pressure and desire for antibiotics in this clinical site is significant. Moreover, previous studies have indicated that education mitigates the problem of over-prescribing antibiotics. Therefore, there is a possibility of replicating similar result at this project setting.

Needs Assessment

An informal interview with providers at the project setting indicates that most patients with VURIs usually present to the clinic with the hope of getting an antibiotic. There are some incidents in which patients have used coarse language towards providers, slammed doors, and walked out in the middle of the visit when providers refuse to prescribe antibiotics inappropriately. Sometimes, in order to satisfy a patient and to avoid spending extra time offering an explanation, some providers will prescribe antibiotics for viral infection against treatment guidelines. The impact of a patient's influence on clinicians' prescription of antibiotics for VURIs tends to be more rampant in ambulatory centers, such as emergency rooms and urgent care centers, as these are places where patients usually present with their viral symptoms.

Annually, about seven million adults presents to outpatient and emergency departments with complaint of acute pharyngitis (Mossad, 2013). This only accounts for 1% to 2% of all outpatient and emergency department visits (Mossad, 2013). Gill, Fleischut, Pellini, Crawford, and Nash (2006), using the Medical Quality Improvement Consortium (MQIC) database, found that in a national sample of office-based practices, the prescription of antibiotics for viral infections was much higher than recommended. In addition, a study of over 52,000 cases of viral upper respiratory infections in an outpatient ambulatory network indicated that 65% of the patients received antibiotics (Zoorob, Sidani, Fremont, & Kihlberg, 2012).

Theoretical Framework

According to Polit and Beck (2008), a theoretical framework helps guide research by determining what needs to be measured and what statistical relationships need to be investigated. The health belief model utilizes the intrapersonal approach, which focuses on a person's knowledge, fears, and perceptions when creating intervention and prevention programs. This model will be used to guide the project. The health belief model proposes that a person's health-related behavior depends on the person's perceptions about how severe an illness is, how susceptible the person is, and how beneficial it is to take preventative measures (Nursing Theories, 2013). In other words, this model emphasizes that individuals can modify their health-seeking behavior based on how much of a danger they perceive an illness to be and the benefits they believe to be associated with modifying their health behavior (Nursing Theories, 2013).

The health belief model is very relevant and important to the current healthcare system, especially with the increasing cost of healthcare services, and to this proposed project. The creation of awareness of the associated complications and consequences with the misuse of antibiotics can help influence a patient's understanding about when and when not to ask for antibiotics. If awareness of the problem is able to facilitate a patient's understanding about the treatment guidelines for viral infection, it will help facilitate a better quality of life and also save significant money and healthcare resources by reducing the complications associated with the inappropriate use of antibiotics.

Method

This section presents the methodology of the project. Topics include the design, sample, and assessment tool to be used in the project.

Design

This project utilized a quasi-experimental design in which a single group completed a pretest and posttest questionnaire. The participants for this project were patients who presented to the clinic with complaints of viral symptoms--for the purpose of this project, they presented with acute pharyngitis, acute sinusitis, bronchitis, and the common cold. An institutional review board (IRB) approval was obtained from Capella University, and the site where the project was completed also gave written approval for the project.

Sample

There were 45 participants in the project: 26 females, ten males, and nine participants who did not respond. The participants' educational level ranged from eighth grade to college level. The group included one Hispanic participant, one Asian participant, 32 Caucasian participants, and 11 participants who did not respond. Twenty-seven of the participants were employed, five participants were not employed, and thirteen participants did not respond. The income for the participants ranged from none to $100,000 yearly.

Assessment Tool

A questionnaire adapted from a previous similar study was modified to the patient population and administered as a pretest and posttest (Linder & Singer, 2003). There were 20 questions on the pretest questionnaire and 19 questions on the posttest questionnaire. The questions were worded so that they measured and provided information about demographics factors that can contribute to desire for antibiotics, reason for visit, characteristics of present illness, expectation of visit, and desire for antibiotics. The reliability of the questionnaire was assessed using a Cronbach's alpha. Its results usually range between 0.00 and + 1.00, with a result of 0.70 and above considered as acceptable (Polit & Beck, 2008). The Cronbach's alpha for this project was 0.738. To ensure validity, questions were close-ended and wordings were very clear and basic, eliminating any chance of confusion.

Intervention

The project site is a quick care section of a community health center. The clinic is staffed by nurse practitioners and provides care for patients ages two and above presenting with acute symptoms. Inclusion criteria for this project were that the patient had to be 18 years or older and to present with at least one of the following: cough/bronchitis, acute sinusitis, acute pharyngitis, or the common cold. After a patient was identified as a potential participant, the project facilitator reviewed the project with the patient and asked if he or she wanted to participate. If a patient agreed to participate, an informed consent approved by the Capella University IRB was reviewed with the patient, and any questions and concerns were addressed. If the patient agreed to continue with the project after the consent was reviewed, they signed the informed consent confirming their willingness to participate and their understanding of the purpose of the project.

Each participant had a packet made that contained the informed consent, the pretest questionnaire, an educational brochure, and the second questionnaire. Each patient was then given a $5 Dunkin' Donuts gift card for participating. After patients signed the informed consent, they were given the pretest questionnaire. When they completed and returned the pretest questionnaire to the facilitator, the educational brochure was then given to them. Upon finishing the brochure, they received the second questionnaire. All project documents were then returned to their initial envelope, and to complete the project, the facilitator printed and de-identified each patient's visit note and then put it in the envelope and sealed it to be delivered to the project coordinator.

The pretest and the posttest questionnaires had the same questions, except that the pretest questionnaire was created to capture patient's demographics and characteristics of illness. The first two questions were worded to get more information about the patient's present illness. The patient's reason for visiting was measured with questions: "Have you missed work or school due to illness?" "Are you worried about your sickness?" and "Why do you want to get better?" A patient's desire for antibiotics was measured with positive response to questions such as "I want antibiotics," "I want antibiotics today," "Do you plan to

ask for antibiotics today?" "Do you think antibiotic will work for a cold?" and if they chose antibiotics when asked about their reason for seeking care.

A patient's knowledge about treatment for viral infections was measured by response to questions such as "Do you think repeated antibiotics use is harmful to you personally?" "What do you think is the best treatment for you illness?" and "Do you believe antibiotics are generally needed for strep throat, other sore throat, bacterial infection, ear infection, stuffy running nose with dark or green mucus, cold, flu, bronchitis, cough, sinus infection and viral infection?"

A patient's assertiveness was measured with the following questions: "Do you often know what treatment you want before you go to a physician?" "What do you think is the best treatment for your illness?" "Do you often understand your illness before going to a doctor?" "After you go to a doctor, how well do you understand your illness?" and "Can you express disagreement with your physician's plan of care?" The project intervention was a CDC brochure that explains the difference between bacteria and viruses, as well as antibiotic resistance. It also explains when antibiotics are and are not appropriate.

Secondary Outcomes

In addition to the project's main objective, the following are additional outcomes and relationships that emerged from the results of the demographics provided during the project intervention: the effect of social economic status, gender, and educational level on the patient desire for antibiotics. A patient's social-economic status and education level can be influential factors as to whether a patient will request antibiotics or not. People in the middle and upper socio-economic class generally are educated and employed; therefore, the need to avoid missed work days can influence their desire to request antibiotics for viral infection. Because women are usually the caregivers in their household, their need for a quick recovery in order to take care of their family could influence their request for antibiotics.

Results

A chi-square test was conducted to determine whether the patient's desire of antibiotics for viral upper respiratory infections significantly differed because of the educational intervention. The project

outcomes are presented in tables with descriptive narratives. However, before testing the project objective, the summaries of the demographic information are presented. Then, the results of the chi-square tests and cross tabulation of responses are presented.

The sample respondents were 45 patients who presented to the clinic with complaints of viral symptoms--for the purpose of this project, they presented with symptoms of acute pharyngitis, acute sinusitis, bronchitis, and the common cold. The frequency and percentage of the categorically-measured demographic variables of gender, race, employment status, economic status, educational level, are summarized in Table 1. There were twice as many female participants as males. The majority of the respondents were white and employed; however, nearly 25% did not respond to this question. The vast majority of respondents complained of the common symptoms of nasal congestion and productive cough with purulent sputum. Over half of the sample respondents did not complete up to a twelfth-grade level of education. For the number of days the 45 respondents have been sick with any of the stated illness, the respondents were sick for an average of 10.42 days (SD = 14.43) before the educational intervention and an average of 8.17 days (SD = 7.88) after the educational intervention. The large discrepancy between the results of average sick days before and after intervention can be explained by the fact that a respondent who claimed to be sick for "90+" days in the pretest later indicated that he or she was only sick for "2" days in the posttest.

A chi-square test of association was conducted to evaluate the effectiveness of an educational intervention in reducing a patient's desire for antibiotics for viral upper respiratory infections. The chi-square test determined whether the patient's desire of antibiotics for viral upper respiratory infections significantly differed between the two periods of pre- and post-educational intervention. A level of significance of p = 0.05 was used in the chi-square analysis. The results are presented in Table 2. The results of the chi-square test showed that only the responses on the expectation for the visit today for having "an antibiotic" (X^2 (1) = 5.31, p = 0.02), "do you think antibiotic will work for a cold?" (X^2 (2) = 16.18, p < 0.001), "do you think repeated antibiotics use is harmful to you personally?" (X^2 (2) = 9.97, p = 0.01), do you

belief that antibiotics are generally needed for "stuffy running nose with dark or green mucus?" (X^2 (1) = 10.60, $p < 0.001$) and "flu" (X^2 (1) = 4.09, $p = 0.04$) were significantly different between the two periods of pre- and post-educational intervention. These results indicated that the educational intervention had a significant effect on patient's desire of antibiotics for viral upper respiratory infections.

A chi-square test of association was also conducted to determine the effects of demographic information of gender, economic status, and level of education on the patients' desire or request for antibiotics for viral upper respiratory infections. The chi-square test determined whether the patients' desire of antibiotics for viral upper respiratory infections significantly differed by gender, economic status, and level of education. A level of significance of 0.05 was used in the chi-square analysis. Chi-square test results to determine the effects of gender on the patients' desire or request for antibiotics for viral upper respiratory infections are presented in Table 3. The results of the chi-square test showed that the gender of the patients did not significantly affect the patients' desire or request for antibiotics for viral upper respiratory infections. All the *p*-values were all greater than the level of significance of 0.05, indicating the insignificance of the effect of gender.

Chi-square test results to determine the effects of economic status on the patients' desire or request for antibiotics for viral upper respiratory infections are presented in Table 4. The results of the chi-square test showed that only the responses on the "I want antibiotics today" (X^2 (1) = 5.31, $p = 0.02$), "Do you plan on asking for antibiotics today?" (X^2 (2) = 16.18, $p < 0.001$), and "Can you discuss your treatment plan with the doctor before decision is made?" (X^2 (2) = 9.97, $p = 0.01$) were significantly affected by the differences of economic status of the patients.

Cross tabulation was conducted to further determine how the responses on "I want antibiotics today," "Do you plan on asking for antibiotics today," and "Can you discuss your treatment plan with the doctor before decision is made?" significantly differed by economic status of the patients. The results are presented in Table 4. The cross tabulation showed that more patients said "yes" to "I want antibiotics today," "Do you

plan on asking for antibiotics today," and "Can you discuss your treatment plan with the doctor before decision is made?" for those with lower levels of economic status.

The results of the chi-square test showed that only the response on the "After you go to a doctor, how well do you understand your illness?" (X^2 (9) = 34.29, $p < 0.001$) was significantly affected by the differences of level of education of the patients. Cross tabulation was conducted to further determine how the response on "After you go to a doctor, do you understand your illness?" significantly differed by level of education of the patients. The cross tabulation showed that more patients said "yes" to "After you go to a doctor, do you understand your illness?" for those with higher levels of education.

Discussion

The results of this project indicate that implementing an educational intervention about the recommended guidelines for treatment of VURIs can significantly reduce a patient's desire for antibiotics for this viral illness. The results of the chi-square tests showed that the responses on the expectation for the visit today for having "an antibiotic," "do you think antibiotic will work for a cold," "do you think repeated antibiotics use is harmful to you personally," and the belief that antibiotics are generally needed for "stuffy running nose with dark or green mucus" and "flu" were significantly different between the two periods of pre- and post-educational intervention. There were significantly fewer patients who expected having "an antibiotic" for their visit, who said "yes" that an antibiotic will work for a cold/stuffy running nose with dark or green mucus/flu, and who said "no" that they do not think repeated antibiotics use is harmful to them personally, after undergoing the educational intervention in reducing a patient's desire for antibiotics for viral upper respiratory infections when compared to the pre-intervention data.

The results of the chi-square test also showed that only the responses on the "I want antibiotics today," "Do you plan on asking for antibiotics today," and "Can you discuss your treatment plan with the doctor before decision is made?" were significantly affected by the differences of economic status of the patients; while the response on the "After you go to a doctor, how well do you understand your illness?" was significantly affected by the differences of level of education of the patients. This is consistent with previous

studies as lower socio-economic status was noted to be a contributing factor of patient's desire for antibiotics (Kozyrskyj et al., 2004; Matuz et al., 2005).

Another finding indicated that there was a reduction in positive response after the educational intervention when patients were asked whether antibiotics were needed for sore throat (other than strep), stuffy running nose with dark or green mucus, cold, flu, bronchitis, cough, sinus infection, and viral infection. However, 62.2% of the participants answered "yes" when asked if antibiotics are needed for stuffy nose with purulent discharge, 80% to bronchitis, and 88.9% to sinus infection; 66.2 % said that antibiotics are generally needed for viral infections. These findings indicated that lack of adequate knowledge about the difference between bacterial and viral infections, as well as their management, is a contributing factor to the inappropriate request of antibiotics (Currie, Lin, & Zhang, 2011; Friedman et al., 2011; Jose, Jimmy, AlSabahi, & AlSabei, 2013).

Previous studies noted gender as an influential factor in patient's desire for antibiotics (Blommaert et al., 2013; Gjelstad, Dalen, & Lindbaek, 2009). The results of these previous studies suggested that women are more likely to request antibiotics when treated for viral infections. Even though the participants for this project included 26 females, ten males, and nine participants with no response, results of the chi-square test showed that the gender of the patients did not significantly affect the patients' desire or request for antibiotics for viral upper respiratory infections. All the *p*-values were greater than the level of significance of 0.05, indicating insignificance of the effect of gender.

Participants with higher level of education also reported that they have better knowledge of their illness after a doctor's visit. The reason for this could because clinicians are not explaining the plan of care with the patient in terms that are easily understood.

Limitation

The main limitation of this project is its sample size, and this could be partly because the project was implemented during the summer. If the project had been implemented during the *cold* months, there might have been a greater chance of recruitment of a larger sample size, and this could have influenced the result of

the project differently. The project was conducted over a period of one month. An extended period for the project could have enhanced the recruitment rate. Data collection was done in the period patients wait after registration to be seen by the provider. There is a possibility that participants hurriedly filled out their questionnaires so that they would not lose their position in line. The population of the patient served at the clinic posed another limitation for the project. The majority of the patients served in this clinic have low socio-economic status. If this project had been conducted in a clinic that serves primarily an educated, middle and upper class population, the effect of economic status on a patient's desire for antibiotics for VURI might have yielded a different result. Finally, a Dunkin' Donuts gift card was given to participants as an incentive for participation, which could have influenced each patient's response.

Recommendations for Practice

Nurses make up the largest professional group within the healthcare system, are recognized by the public as one of the most trusted professionals, and are usually in the frontline in healthcare (Institute of Medicine, 2010). With the increasing adoption of advance practice nurses as clinicians, nurses now have even more opportunities to utilize and maximize their strengths of size, diversity, and trusting and exceptional connection with the public (Buresh & Benner, 2006). Advance practice nurse can greatly influence the healthcare system and improve the quality of life of their patients by incorporating patient education in their plan of care and adopting the recommended treatment guidelines.

While a significant number of the participants would like to be prescribed antibiotics (66.7%), their primary reason for this visit is to get a diagnosis (64.4%) and to receive medication (77.8%), which is not necessarily an antibiotic. As clinicians, it is necessary to acknowledge a patient's expectation of the visit, make them feel heard and cared for, and then provide them with the alternative and conservative management of their symptoms when the need for antibiotics is not indicated. Constant education and materials such as brochures and wall posters that are patient-focused and at basic reading level will contribute to the reduction of requests for antibiotics for VURIs, hence reducing the pressure on providers to prescribe antibiotics inappropriately.

Future Implications

Based on the result of this project, future researchers trying to probe similar questions should try to implement their project over a longer period, preferably during the winter months so that there is a room to recruit more participants, thereby increasing the ability to detect more subtle effects and enhance the diversity of the participants. This will ensure that every population is adequately represented in the project sample. Rather than squeezing intervention into a small time-period such as a wait period before office visit, future researchers should allow participants more time to answer their questionnaires and read their educational pamphlet.

Conclusion

In conclusion, the increasing rates of inappropriate antibiotic prescriptions have been noted to be detrimental to healthcare in several aspects, including the quality of care of patients and financially. Antibiotic resistant infections are typically more difficult to treat, hence a higher risk of worse clinical outcomes and death, spread of infections and prolong use of health care resources (World Health Organization, 2014). The number of the isolated antibiotic resistance cases continues to increase, and therefore, it is imperative that this issue is addressed sooner than later. Patient education has been identified as a potential solution to this problem.

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References

Blommaert, A., Coenen, S., Gielen, B., Goossens, H., Hens, N., & Beutels, P. (2013). Patient and prescriber determinants for the choice between amoxicillin and broader-spectrum antibiotics: A nationwide prescription-level analysis. *Journal of Antimicrobial Chemotherapy, 68*(10), 2383-2392. doi:10.1093/jac/dkt170

Buresh, G. B., & Benner, P. (2006). *From silence to voice: What nurses know and must communicate to the public* (2nd ed.). New York, NY: Cornell University Press.

Butler, C. C., Rollnick, S., Pill, R., Maggs-Rapport, F., & Stott, N. (1998). Understanding the culture of prescribing: Qualitative study of general practitioners' and patients' perceptions of antibiotics for sore throats. *British Medical Journal, 317*, 637-642. doi:10.1136/bmj.317.7159.637

Butler, C. C., Simpson, S. A., Dunstan, F., Rollnick, S., Cohen, D., Gillespie, D., . . . Hood, K. (2012). Effectiveness of multifaceted educational programme to reduce antibiotic dispensing in primary care: Practice based randomised controlled trial. *British Medical Journal, 344*, 1-13. doi:10.1136/bmj.d8173

Centers for Disease Control and Prevention. (2011). *Antimicrobial resistance posing growing health threat*. Retrieved from http://www.cdc.gov/media/releases/2011/p0407_antimicrobialresistance.html

Centers for Disease Control and Prevention. (2014). *Antibiotic resistance threats in the United States, 2013*. Retrieved from http://www.cdc.gov/drugresistance/threat-report-2013/

Currie, J., Lin, W., & Zhang, W. (2011). Patient knowledge and antibiotic abuse: Evidence from an audit study in China. *Journal of Health Economics, 30*(5), 1-17. doi:10.1016/j.jhealeco.2011.05.009.

Friedman, B. C., Schwabe-Warf, D., & Goldman, R. (2011). Reducing inappropriate antibiotics use among children with influenza infection. *Canadian Family Physician, 57*(1), 42 -44. PMC:3024158

Gill, J. M., Fleischut, P., Pellini, B., Crawford, A., & Nash, D. B. (2006). Use of antibiotics for adult upper respiratory infections in outpatient settings: A national ambulatory network study. *Family Medicine, 39*(Supplement 1), 349-354. PMID: 16673197

Gjelstad, S., Dalen, I., & Lindbaek, M. (2009). GPs' antibiotic prescription patterns for respiratory tract infections – still room for improvement. *Scandinavian Journal of Primary Health Care, 27*(4), 208-215. doi:10.3109/02813430903438718

Gonzales, R., Steiner, J. F., Lum, A., & Barrett. (1999). Decreasing antibiotics use in ambulatory practice: Impact of a multidimensional intervention on the treatment of uncomplicated acute bronchitis in adults. *The Journal of American Medical Association, 281*(16), 1512 - 1519. PMID: 10227321

Gonzales, R., Steiner, J. F., Maselli, J., & Lum, A. (2001). Impact of reducing antibiotics prescribing for acute bronchitis on patient satisfaction. *Effective Clinical Practice, 4*(3), 105-111. PMID:11434073

Hersh, A. L., Shapiro, D. J., Pavia, A. T., & Shah, S. S. (2011). Antibiotic prescribing in ambulatory pediatrics in the United States. *Pediatrics, 128*(6), 1053-1061. doi:10.1542/peds.2011-1337

Hooton, T. M., & Levy, S. B. (2001). Antimicrobial resistance: A Plan of action for community practice. *American Family Physician, 63*(6), 1087-1097. PMID: 11277546

Institute of Medicine. (2010). *The Future of nursing: Leading change, advancing health.* Washington, DC: The National Academies Press.

Jose, J., Jimmy, B., AlSabahi, A. G., & Al Sabei, G. A. (2013). A study assessing public knowledge, belief and behavior of antibiotic use in an omani population. *Oman Medical Journal, 28*(5), 324-330. doi:10.5001/omj.2013.95

Kozyrskyj, A., Dahl, M., Chateau, D., Mazowita, G., Klassen, T., & Law, B. (2004). Evidence-based prescribing of antibiotics for children: Role of socioeconomic status and physician characteristics. *Canadian Medical Association Journal, 171*(2), 139-145. doi:10.1503/cmaj.1031629

Linder, J. A., & Singer, D. E. (2003). Desire for antibiotics and antibiotic prescribing for adults with upper respiratory infectins. *British Medical Journal, 18*(10), 1-7. doi:10.1046/j.1525-1497.2003.21101.x

Matuz, M., Benko, R., Doro, P., Hadju, E., Nagy, G., & Nagy, E. (2005). Regional variations in community consumption of antibiotics in Hungary 1996-2003. *British Journal of Clinical Pharmacology, 61*(1), 96-100. doi:10.1111/j.1365-2125.2005.02525.x

McEwen, M., & Wills, E. M. (2007). *Theoretical basis for nursing* (2nd ed.). Philadelphia, PA: Wolters Kluwer/Lippincott William & Wilkins.

Mossad, S. B. (2013). *Upper respiratory tract infections*. Retrieved from http://www.clevelandclinicmeded.com/medicalpubs/diseasemanagement/infectious-disease/upper-respiratory-tract-infection/

Nursing theories: A companion to nursing theories and models. (2013, September). *Current Nursing.* Retrieved from: http://currentnursing.com/nursing_theory/health_belief_model.html

Petersen, I, A. M., Islam, A., Duckworth, G., Livermore, D. M., & Hayward, A. C. (2007). Protective effect of antibiotics against serious complications of common respiratory tract infections: Retrospective cohort study with the UK General Practice Research Database. *British Medical Journal, 335*, 1-6. doi:10.1136/bmj.39345.405243.BE

Polit, D. F., & Beck, C. T. (2008). *Nursing Research: Generating and assessing evidence for nursing practice* (8th ed.). Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins.

Reardon, S. (2014). Antibiotic resistance sweeping developing world: Bacteria are increasingly dodging extermination as drug availability outpaces regulation. *Nature, 509*, 141-142. doi:10.1038/509141a

Robert, L. (2015, April 27). *Top 10 reasons why patients come to primary care*. Retrieved from http://www.consultantlive.com/diabetes/top-10-reasons-why-patients-come-primary-care

Stearns, C. R., Gonzales, R., Camargo, C. A., Maselli, J., & Metlay, J. P. (2009). Antibiotic prescriptions are associated with increased patient satisfaction with emergency department visits for acute respiratory tract infections. *Academic Emergency Medicine, 16*(10), 934-941. doi:10.1111/j.1553-2712.2009.00522.x

Stokowski, L. A. (2010). *CDC commentary: Conquering antibiotics overuse*. Retrieved from http://www.medscape.com/viewarticle/733042

Vinnard, C., Linkin, D. R., Localio, R., Leonard, C. E., Teal, V. L., Fishman, N. O., & Hennessey, S. (2013). Effectiveness of interventions in reducing antibiotic use for upper respiratory infections in ambulatory care practices. *Population Health Management, 16*(1), 22-27. doi:10.1089/pop.2012.0025

Wong, D. M., Blumberg, D. A., & Lowe, L. G. (2006). Guidelines for the use of antibiotics in acute upper respiratory tract infections. *American Family Physician, 74*(6), 956-966. PMID:17002029

World Health Organization. (2014). *Antimicrobial resistance*. Retrieved from http://www.who.int/mediacentre/factsheets/fs194/en/

Zolaly, M. A., & Hanafi, M. I. (2011). Factors affecting antibiotics' prescription in general pediatric clinics. *Journal of Taibah University Medical Sciences, 6*(1), 33-41. doi:10.1016/S1658-3612(11)70154-8

Zoorob, R., Sidani, M., Fremont, R., & Kihlberg, C. (2012). Antibiotic use in acute upper respiratory tract infections. *American Family Physician, 86*(9), 817-822. PMid:23113461

Table 1

Frequency and Percentage Summaries of Demographic Information (n = 45)

	Frequency	Percent
Gender		
Females	26	57.8
Male	10	22.2
No response	9	20.0
Race		
Asian	1	2.2
Hispanic	1	2.2
White	32	71.1
No response	11	22.4
Employment Status		
Employed	27	60.0
Unemployed	5	11.1
No response	13	28.9
Level of education		
1 < 12th grade	4	8.8
2 12th grade	17	37.8
4 Some college	1	2.2
5 College	11	23.9
6 No response	12	26.7

Table 2

Cross tabulation of Patient's Desire of Antibiotics for VURI by Different Periods

		N	Pre Test %	N	Post Test %	Pearson Chi Square Value
I want an antibiotic	no	25	55.6	36	78.3	X^2 (1) = 5.31,
	yes	20	44.4	10	21.7	p = 0.02)
Do you think antibiotic will	no	26	57.8	43	93.5	X^2(2) = 16.18,
work for cold?	yes	15	33.5	3	6.5	p < 0.001)
	don't know	4	8.9	0	0.0	
Do you think repeated	no	21	46.7	8	17.4	X^2 (2) =9.97,
antibiotic use is harmful to you	yes	22	48.9	37	80.4	p + 0.01
personally?	don't know	2	4.4	1	2.2	
Do you think that antibiotics	no	17	37.8	33	71.7	X^2 (1) =
are needed for "stuffy nose	yes	28	62.2	13	28.3	10.60, p
with dark mucus	don't know					<0.001)
Do you think belief that	no	23	51.1	33	71.7	X^2 (1) = 4.09,
antibiotics are generally needed	yes	22	48.9	13	28.3	p = 0.04
for flu?	don't know					

Table 3

Chi-Square Test Results of Effects of Gender on Patient's Desire of Antibiotics for Viral Upper Respiratory Infections

	Pearson Chi-Square Value	df	Asymp. Sig. (2-sided)
I want antibiotics today	4.05	4	0.40
Do you plan on asking for antibiotics today	2.31	4	0.68
Do you think antibiotic will work for a cold	1.83	4	0.77
Do you think repeated antibiotics use is harmful to you personally?	3.29	4	0.51
Do you often know what treatment you want before you go to a physician?	6.12	4	0.19
What do you think is the best treatment for you illness?	2.48	4	0.65
Do you often understand your illness before going to a doctor?	0.10	2	0.95
After you go to a doctor, how well do you understand your illness	3.83	2	0.15
Can you in express disagreement with you physician's plan of care?	0.54	2	0.76
Can you discuss your treatment plan with the doctor before decision is made?	0.87	2	0.65

Table 4

Chi-Square Test Results of Effects of Economic Status on Patient's Desire of Antibiotics for Viral Upper Respiratory Infections

	Pearson Chi-Square Value	df	Asymp. Sig. (2-sided)
I want antibiotics today	62.18	40	0.01*
Do you plan on asking for antibiotics today	64.42	40	0.01*
Do you think antibiotic will work for a cold	44.33	40	0.29
Do you think repeated antibiotics use is harmful to you personally?	43.33	40	0.33
Do you often know what treatment you want before you go to a physician?	19.42	40	1.00
What do you think is the best treatment for you illness?	35.66	40	0.67
Do you often understand your illness before going to a doctor?	17.49	20	0.62
After you go to a doctor, how well do you understand your illness	29.73	20	0.07
Can you in express disagreement with you physician's plan of care?	20.54	20	0.43
Can you discuss your treatment plan with the doctor before decision is made?	36.96	20	0.01*

*Significant at level of significance of 0.05

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Capella University's Academic Honesty Policy (3.01.01) holds learners accountable for the integrity of work they submit, which includes but is not limited to discussion postings, assignments, comprehensive exams, and the dissertation or capstone project.

Established in the Policy are the expectations for original work, rationale for the policy, definition of terms that pertain to academic honesty and original work, and disciplinary consequences of academic dishonesty. Also stated in the Policy is the expectation that learners will follow APA rules for citing another person's ideas or works.

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Learners are expected to be the sole authors of their work and to acknowledge the authorship of others' work through proper citation and reference. Use of another person's ideas, including another learner's, without proper reference or citation constitutes plagiarism and academic dishonesty and is prohibited conduct. (p. 1)

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I attest that this dissertation or capstone project is my own work. Where I have used the ideas or words of others, I have paraphrased, summarized, or used direct quotes following the guidelines set forth in the APA Publication Manual.

Learner name and date	Adedamola Solawon, 11/25/15
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