Use of a Decision Aid to Improve Decisional Comfort in College Students Treated for Respiratory Tract Infections

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Abstract

Decision aids have been shown to facilitate shared decision making, recognize and respect patient values, improve patient experience by designing care around those values and increase patient comfort with decisions made. The objective of the study was to determine the effectiveness of a decision aid to 1) increase decisional comfort with the appropriate use of antibiotics for respiratory tract infections and 2) maintain antibiotic prescribing rates at current levels. Participants were English-speaking college students age 18 and over diagnosed with a respiratory tract infection in the general medical clinic of a university health center from August 31, 2015-May 6, 2016. Pre- and post-intervention surveys were used to measure decisional conflict of students. Intervention included staff training in shared decision making and the use of a decision aid. Students who received routine care were 2.2 times [N=643; p=<.001; 95% CI (1.55, 3.12)] more likely to experience decisional conflict than students whose care included the decision aid. Antibiotic prescribing rates were maintained at pre-intervention levels. Use of a decision aid shows promise to increase comfort with the appropriate treatment of respiratory tract infections while maintaining antibiotic prescribing rates.

Key Words: Respiratory tract infections, shared decision making, decision aid, college students, antibiotic use

Background

Haltiwanger, Hayden, Weber, Evans, & Possner (2001) found that 55% of college students seeking care for an upper respiratory tract infection expected to receive an antibiotic. More than fifteen years later college health providers continue to endure challenges related to antibiotic prescribing and often feel pressure to prescribe unnecessary antibiotics for respiratory tract infections (Blyer & Hulton, 2016). In recent years, antibiotic resistance has gained global attention as a serious threat to modern medicine making the treatment of patients difficulty and costly. In the United States alone, it is estimated that antibiotic resistance costs $21 to $34 billion annually and equals more than eight million additional patient hospital days (World Health Organization, 2014). Respiratory tract infections are the most common diagnosis for antibiotics prescribing and overuse which leads to the promotion of antibiotic resistance (Shapiro, Hicks, Pavia, & Hersh, 2014; World Health Organization, 2012). In addition, The National Strategy for Combating Antibiotic-Resistant Bacteria (2014) calls for cooperation of health care providers and patients to work together to combat overuse of antibiotics (Phillips, 2015).

The university health center participating in the current study had a pre-study antibiotic prescribing rate of 33% for respiratory tract infections. In the United States, outpatient clinic antibiotics are prescribed, on average, 51% of the time for adults with respiratory tract infections with the lowest reported prescribing rate being 38% (Shapiro et al., 2014). While the participating site has a relatively low antibiotic prescribing rate, the prescribing providers are regularly pressured by patients to prescribe antibiotics. These patients often come from family doctors and pediatricians who prescribe antibiotics at higher rates, leading to a patient preference for treatment with antibiotics over other more appropriate treatment options. In fact, patient expectations are often the reason that inappropriate antibiotics are prescribed (Blyer & Hulton, 2016). Lack of knowledge regarding treatments and treatment options that are not a patient's preference can lead to decisional conflict (Ferron et al., 2014). Decisional conflict is defined as an, "individuals' level of comfort with a decision" (Ferron et al., 2014). Decisional conflict can lead to physical and emotion stress for the patient and can lead the patient to lay blame on the health care provider (Ferron et al., 2014). Assessment of a patient's decisional conflict is an important piece of shared decision making and leads to good health care decisions (Ferron et al., 2014).

College health centers are in a position to produce educated patients who understand and adhere to appropriate antibiotic prescribing for respiratory tract infections, promoting life-long antibiotic stewardship (Blyer & Hulton, 2016). Haltiwanger et al. (2001) found receipt of antibiotics, a clear diagnosis, and an explanation of the reason for treatment were significantly associated with patient satisfaction in college students. Study recommendations included better patient education and improved clinician-patient communication. Likewise, Alden, Merz, and Akashi (2012) found college students in the United States prefer a collaborative role in health care decision making. Shared decision-making, a clinician-patient communication process that encourages patients to take a collaborative role in medical decision making, shows promise as a method to promote appropriate use of antibiotics for respiratory tract infections in the college population (Blyer & Hulton, 2016).

Considering that shared decision making has not been shown to decrease prescribing in providers with already low antibiotic prescribing rates (Briel et al., 2006) and the fact that the setting already has relatively low prescribing rates, the focus of this study was to increase student's comfort with treatment of respiratory tract infections, not to decrease antibiotic prescribing rates. The study question was "In the college population, does shared decision making, through the use of a decision aid, increase decisional comfort with treatment of respiratory tract infections while maintaining current antibiotic prescribing rates?" The objectives of this study were to determine the effectiveness of a decision aid to 1) increase student comfort with the treatment of respiratory tract infections while 2) maintaining antibiotic prescribing rates at or below current levels.

Methods

Setting and Population

The study took place in the general medical clinic of a university health center located in the Mid-Atlantic region. The health center serves a student body of over 21,000 and provides health care services for over 30,000 student encounters each year. Respiratory tract infections account for approximately 5,000 student visits to the clinic each year, accounting for 22% of visits. Four providers from the general medical clinic, including two physicians and two nurse practitioners, participated in the study. The study included a convenience sample of consecutively selected, English speaking patients, 18 years and older who made an appointment with participating

providers at the University Health Center General Medicine Clinic between August 31, 2015 and May 6, 2016 and who were diagnosed with a respiratory tract infection (no sample size calculations were performed).

Design

The study consisted of pre- and post-intervention phases and was guided by the Ottawa 5 Step Process for the Implementation of a Decision Aid (The Ottawa Hospital Research Institute, 2014). The Ottawa 5 Step Process includes: 1) Identify the decision, 2) Find patient decision aids, 3) Identify barriers, 4.1) Implementation, 4.2) Provide Training, and 5) Monitor use and outcomes. The pre-intervention phase of the study provided baseline data on decision comfort and took place from August 31, 2015 to December 18, 2015, when participating providers offered students diagnosed with a respiratory tract infections usual care and participation in the study through an anonymous self-administered patient survey. Students who chose participation in the study completed the patient survey at the checkout area of the clinic after leaving the exam room. The contents of this survey are described below.

Following the pre-intervention phase, participating providers completed shared decision making training using online training videos. Provider participation in the study was voluntary and no providers had previous experience with shared decision making or the use of decision aids. Video material was based on the SHARE Approach developed by the Agency for Healthcare Research and Quality (AHRQ) (Agency for Healthcare Research and Quality, 2014). Role play and hands-on training were used to educate providers on the use of shared decision making and use of the selected patient decision aid.

The post-intervention phase of the project took place from January 11 to May 6, 2016. Students were offered participation in the study using the same survey and method as during the pre-intervention phase. Providers indicated whether or not they used the decision aid at the bottom of the patient survey. The study was approved by the Institutional Review Board (IRB) at the participating university.

The patient decision aid selected for use was, “Taking an Antibiotic or Not? Acute Respiratory Tract Infections (ARI) ©” (Labrecque, LeBlance, Légaré, & Cauchon, 2010). Permission for use was obtained. This decision aid satisfies criteria for a patient decision aid and is listed in the

Ottawa Hospital Decision Aid Library Inventory (The Ottawa Hospital Research Insititute, 2016). The aid has been used as part of the training program DECISION +2 which has been shown to increase patient involvement in the decsion making process related to use of antibiotics for respiratory tract infections (Légaré et al., 2012). The decision aid consists of six steps which faciliate communication and ultimately shared decision making between the patient and the provider during the visit (Figure1). The aid was designed to be printed and filled out by the provider, with input from the patient, during the medical encounter. After completing the history and physical exam portions of the medical encounter, the provider completes Steps 1 and 2 of the aid to determine the probablity of the patient having a bacterial infection. In Steps 3 and 4, the provider then shares this probability with the patient and explains the benefits and risk of taking an antiboitic or not. Steps 5 and 6 are used to help the patient determine their values and preferences related to the decision and to determine their comfort with the decision they are making (Labrecque et al., 2010). Patient comfort with the decision is assessed on the decision aid using the SURE© test which determines if decisional conflict is present before the patient makes their final decision. The SURE© test was also used on the patient survey as described below.

Figure 1.

Steps in Decision Aid, "Taking an Antibiotic or Not?

Step 1 & 2- Complete Diagnostic Decision Support Tool to estimate probability of bacterial infection

Step 3- Share estimate with patient

Step 4- Communicate treatment options of taking an antibiotic or not and benefits and risks of each

Step 5- Clarify values and preferences of patient

Step 6- Evaluate patient decisional comfort regarding decision

Acute Respiratory Tract Infections (ARI) ©" (Labrecque, LeBlance, Légaré, and Cauchon, 2010)

Data Sources and Analysis

Patient decisional conflict was assessed pre- and post-intervention using the SURE© test (duplicated by permission) on the patient survey. The SURE© test shows adequate psychometric properties (94.3% sensitivity; 89.8% specificity) to determine decisional conflict in the primary care setting and has been used specifically for decisions related to respiratory tract infections (Ferron Parayre, Labrecque, Rousseau, Turcotte, & Legare, 2014). The instrument is recommended as a proxy for determining the quality of a decision and whether or not shared decision making occurred in the decision making process (Ferron et al., 2014). The four items on the SURE© test are summed to determine the decisional conflict score for each individual. Scores range from extremely high decisional conflict (0) to no decisional conflict (4). A score of ≤ 3 indicates clinically significant decisional conflict is present and indicates that the patient is not certain about the best option for them or that they do not have all the information needed to make the decision (Légaré et al., 2010). Student surveys also included demographic information including age, gender identity, and year in college.

Antibioitic prescribing rates for respiratory tract infections were collected during both pre-and post-intervention phases using data from the electronic health record (EHR) system. Diagnosis codes included those associated with acute rhinosinusitis, acute bronchitis, acute pharyngitis, and acute otitis media. EHR reports created for this data included ICD-9/ICD-10 codes for respiratory tract infections to account for the coding changes that occurred during the study. Reports also included the transactions codes for antibioitics commonly used for respiratory tract infections.

Odds ratio were employed to determine the effect of predictor variables on the outcome of decisional conflict. Variables examined included age, gender, academic year, use of decision aid, and antibioitc prescribing. Table 1 depicts the predictor variables in relation to the oucome of decisional conflict.

Table 1:

Logistic Regression Analysis Predicting Decisional Conflict

Predictor Variable	B	Wald Chi-Square Test	*p*	Exp(B)	95% CI
Gender	.033	.034	.854	1.034	.725 - 1.474
Age	.111	.760	.383	1.117	.871 – 1.432
Year in School	-.183	1.449	.229	.832	.617 – 1.122
DA not Used	.788	19.646	.000	2.199	1.552 – 3.116
Constant	-2.499	1.296	.255	.082	

Analysis of decision aid use was not based on before and after data as the same patients were not surveyed in each phase. Analysis of decision aid use was based on provider indication of use verses no use of the decision aid across the study. Antibiotic prescribing was reported as the aggregate percentage of antibiotics prescribed by participating providers for patients with the diagnosis of a respiratory tract infections.

Results

Odds ratios were calculated to determine the potential effect of provider use of decision aids on decisional comfort in this student population. Use of the decision aid was the only statistically significant predictor of decisional conflict. Those who did not have the decision aid used in

consultation were almost 2.2 times more likely than those who did to experience decisional conflict [*N*=643; *p*=<.001; 95% CI (1.55, 3.12)] (Table 1; Table 2). Gender, age, and year of college did not show significant effects on decisional comfort (*p*=<854; 95% CI (.725, 1.47; *p*=.383; 95% CI (.871, 1.43); and *p*=.23; 95% CI (.617, 1.12), respectively) (Table 1).

Table 2.

Frequency Counts of Decision Aid use and Gender

Decision Aid Use	Male	Female	%
Used	64	152	33.5
Not Used	121	307	66.4
Total (*N* = 644)			

Antibiotic prescribing rates did not show any statistically significant (p= .34) change (33% pre-intervention; 31.69%, post-intervention). Demographic differences (gender, age, and year of college) assessed in the study showed no significant effect on decisional comfort.

Discussion

Literature suggests that shared decision making shows promise as one method to promote the appropriate use of antibiotics in the college student population (Blyer & Hulton, 2016). The study aimed to determine if shared decision making in the form of a decision aid could increase college student comfort with the appropriate use of antibiotics for respiratory tract infections while maintaining current antibiotic prescribing rates. For this study, use of the decision aid was the only predictor variable that had a significant effect on decisional comfort. Students in which the decision aid was used were more comfortable with the treatment decision related to their respiratory tract infection, although there was no significant change in antibiotic prescribing rates in this already low-prescribing environment.

One limitation of the study is the degree to which the decision aid was used. Within one week of study implementation providers reported that the student population was making decisions

quickly without needing to complete all six steps of the decision aid. Providers felt that completing the final steps after students declared their decision was redundant and unecessary. Upon being made aware of this phenomenon, the researchers received IRB approval to add a Provider Use of Decision Aid Survey to the end of the implementation phase. The purpose of the additional survey was to assess the extent of decision aid use. All four providers self-reported using Step 1 and Step 2 (diagnostic decision support tool) of the aid “almost always”. Two providers reported using Step 3 (probablity of bacterial infection) and Step 4 (benefits and risks) of the decision aid “almost always” and two providers reported using these steps “sometimes”. Providers reported using Step 5 (values and preferences) from “always” to “not at all”. Step 6 (decisional comfort) was reported to be used from “sometimes” to “not at all”.

Another limitation of the study was the inablity to measure the use of shared decision making within the patient provider interaction. Use of the decision aid to promote shared decision making was assessed but no direct observational data were collected. In addition, patient surveys were anonymous and did not report the diagnosis or antibiotic prescribing for individual patients correlated to decisional comfort. Only aggregate data on prescribing rates pre and post intervention was reported.

While varied use of the decision aid was a limitation of the study, this limitation also provides some important knowledge. Steps 1-4 of the decision aid were the most used in the current study. The content within these steps guided patient-provider communication and educated patients on the risks and benefits of treatment. Haltiwanger et al. (2001) recommended better patient-provider communication and education as a way to promote the appropriate use of antibiotics in college students. The current study supports this recommendation as most students were ready to move forward with treatment following patient-provider communication and education. The previous study also showed that college students were more satisfied with care if an antibiotic was prescribed. While the current study did not measure satisfaction, it did show promise for increasing comfort with treatment without increasing antibiotic prescribing rates.

In the study by Légaré et al. (2012), in which the same decision aid was used, the authors noted that the “active ingredients” of their program where not identified. The current study may also provide knowledge related to some of these “ingredients” related to the decision aid. While all steps of the decision aid are vital to the shared decision making process, steps 1-4 appear to be

the “active ingredients” for the college student population. As the decision aid was developed and validated in Canada, this study also shows promise for use in the United States. Further studies should focus on the use of this decision aid in other settings within the Unitied States, including other college health centers. Further studies with varied populations may lead to recommendations for adaptations based on population.

Conclusions

The Institute of Medicine describes patient-centered care as care that is respectful and responsive to patient preferences, needs and values, and that these values guide clinical decisions-making (IOM, 2001). College health centers are in a position to collaborate with student patients, practice patient-centered care, and promote life-long antibiotic stewardship (Blyer & Hulton, 2016). Shared decision making, specifically using the decision aid, “Taking an Antibiotic or Not? Acute Respiratory Tract infections (ARI) ©” (Labrecque et al., 2010) demonstrates promise to increase college student’s comfort with treatment for respiratory tract infections while maintaining antibiotic prescribing rates at relatively low levels.

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