Literacy-Sensitive Approach to Improving Antibiotic Understanding in a Community-Based Setting

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Background

Antibiotic Usage

- Overuse and misuse of antibiotics contribute to antibiotic-resistant bacterial infections[1]
- Over 2 million people develop severe antibiotic-resistant infections every year with 23,000 deaths and an estimated $20 billion in healthcare costs[1-2]
- 45% of patients responding to a telephone survey believed viruses could be treated using antibiotics[3]
- 47% of adults surveyed do not always take the full course of antibiotics[4]

Patient Impact

- 46% of adults surveyed call their provider to ask for antibiotics when they have a cold or the flu[4]
- Unnecessary antibiotics were prescribed 80% of the time when some form of patient pressure was witnessed[5]
- 46% of patients with URTIs who came to their physician expecting an antibiotic received one; 29% who did not expect an antibiotic received a prescription for one[6]
- 27% of prescriptions were written for treatment of illnesses for which an antibiotic was not indicated[7]

Role of Health Literacy

- "…the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and services to make appropriate health decisions"[8]
- Given that approximately 36% of adult Americans were reported to have basic or below basic health literacy skills,[9] literacy may play a role in antibiotic use

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- No studies were identified relating health literacy to antibiotic knowledge or use

Specific Aims

- This study
  - Developed and deployed a program to enhance patient knowledge about antibiotic use
  - Evaluated whether providing patient education is associated with improvements in antibiotic knowledge
  - Explored the association between antibiotic knowledge and health literacy

Methods

- This study was approved by the University of Oklahoma Health Sciences Center Institutional Review Board

Sample

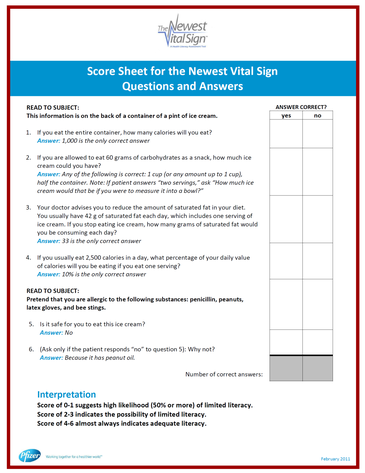
- 28 eligible, community-dwelling participants from within the Tulsa, OK metropolitan area
- ≥ 18 years old
- English-speaking

Study Design

- Prospective, pre-test post-test study
- Participant sociodemographic characteristics, including a measurement of health literacy, were collected at baseline
- Antibiotic knowledge (perceptions of appropriate use) were collected before and after the educational seminar
- Knowledge index constructed – summation of correct answers

Study Implementation

- An informational flyer with scheduled program times was utilized to recruit participants
- Participants completed:
  - Brief demographic survey
  - The Newest Vital Sign (NVS) health literacy survey
  - 14-item pre-test evaluation of current antibiotic knowledge (randomized to 2/3 of participants – 19)
- All participants received:
  - 30-minute educational PowerPoint presentation
  - 14-item post-test evaluation about antibiotic knowledge



The Newest Vital Sign

Score Sheet for the Newest Vital Sign Questions and Answers

READ TO SUBJECT:
This information is on the back of a container of a pint of ice cream.

ANSWER CORRECT? (yes / no)

1. If you eat the entire container, how many calories will you eat?
   Answer: 1,000 is the only correct answer
2. If you are allowed to eat 60 grams of carbohydrates as a snack, how much ice cream could you have?
   Answer: Any of the following is correct: 1 cup (or any amount up to 1 cup), half the container. Note: If patient answers "two servings," ask "How much ice cream would that be if you were to measure it into a bowl?"
3. Your doctor advises you to reduce the amount of saturated fat in your diet. You usually have 42 g of saturated fat each day, which includes one serving of ice cream. If you stop eating ice cream, how many grams of saturated fat would you be consuming each day?
   Answer: 33 is the only correct answer
4. If you usually eat 2,500 calories in a day, what percentage of your daily value of calories will you be eating if you eat one serving?
   Answer: 10% is the only correct answer

READ TO SUBJECT:
Pretend that you are allergic to the following substances: penicillin, peanuts, latex gloves, and bee stings.

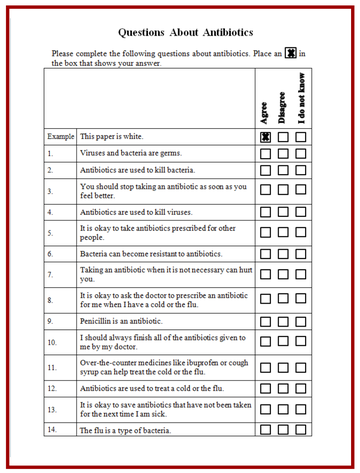
5. Is it safe for you to eat this ice cream?
   Answer: No
6. (Ask only if the patient responds "no" to question 5): Why not?
   Answer: Because it has peanut oil.

Number of correct answers:

Interpretation
Score of 0-1 suggests high likelihood (50% or more) of limited literacy.
Score of 2-3 indicates the possibility of limited literacy.
Score of 4-6 almost always indicates adequate literacy.

Pfizer "Working together for a healthier world"

February 2011



Questions About Antibiotics

Please complete the following questions about antibiotics. Place an ☒ in the box that shows your answer.

		Agree	Disagree	I do not know
Example	This paper is white.	☒	☐	☐
1.	Viruses and bacteria are germs.	☐	☐	☐
2.	Antibiotics are used to kill bacteria.	☐	☐	☐
3.	You should stop taking an antibiotic as soon as you feel better.	☐	☐	☐
4.	Antibiotics are used to kill viruses.	☐	☐	☐
5.	It is okay to take antibiotics prescribed for other people.	☐	☐	☐
6.	Bacteria can become resistant to antibiotics.	☐	☐	☐
7.	Taking an antibiotic when it is not necessary can hurt you.	☐	☐	☐
8.	It is okay to ask the doctor to prescribe an antibiotic for me when I have a cold or the flu.	☐	☐	☐
9.	Penicillin is an antibiotic.	☐	☐	☐
10.	I should always finish all of the antibiotics given to me by my doctor.	☐	☐	☐
11.	Over-the-counter medicines like ibuprofen or cough syrup can help treat the cold or the flu.	☐	☐	☐
12.	Antibiotics are used to treat a cold or the flu.	☐	☐	☐
13.	It is okay to save antibiotics that have not been taken for the next time I am sick.	☐	☐	☐
14.	The flu is a type of bacteria.	☐	☐	☐

Statistical Analysis

- Descriptive statistics were used to described the sample
- Wilcoxon signed rank tests and a dependent samples t-test were used to compare individual and cumulative pre/post antibiotic knowledge scores
- Pearson correlations were used to assess relationship between health literacy and pre-post antibiotic knowledge scores
- Kuder-Richardson 20 (KR20) was used to assess instrument reliability
- Stata 14.1© was used for analyses with a-priori alpha=0.05

Results

- 19 participants completed the seminar and both pre- and post-tests
  - Overall antibiotic knowledge index significantly increased by 2 points (12.95 vs. 10.95, p=0.0011)
  - Health literacy (NVS scores) was not significantly correlated with pre-test antibiotic knowledge scores (r=0.24, p=0.22), but was significantly correlated to post-test antibiotic knowledge scores (r=0.62, p=0.0004)
  - Test reliability was 0.79 and 0.70 for pre- and post-tests, respectively
- All participants
  - Scored lower on subset statements reflecting treatment of viruses

Conclusion

- Patients have limited understanding of bacteria versus viruses and treatment
- Educational programs can improve antibiotic use knowledge
- The educational program may be more effective for those with higher literacy levels

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Disclosure Statement

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

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