Researchers aim to improve asthma patients' care through computer-based simulation program

May 19 2008

Mayo Clinic pulmonary researchers have designed and tested a new patient education computer program intended to help people with asthma manage their disease. The program allows asthma patients (an estimated 7 percent of the U.S. adult population) to practice making key decisions in a safe, simulated environment.

The Mayo Clinic group will present results of a study assessing users' experiences at the American Thoracic Society's 2008 International Conference in Toronto.

To improve delivery of asthma patient education messages, the Mayo team created a user-friendly tool called CASPER (Computerized Asthma Self-management Program and Educational Resource for adults). CASPER is an interactive story-based, Web-enabled asthma simulation program to enhance patients' ability to consistently treat their asthma. To progress through CASPER, patients answer questions displayed on the screen following a simulated asthma-attack scenario, such as "Bob's Night Time Wakening." The scenario portrays a familiar asthma event in pictures and text, and asks patients how to treat it. In response to the choice they enter on the computer, patients receive a comment that explains the best action to take in the story scenario, as well as why the other choices are not as effective.

This type of education is needed, researchers say, because learning how

to manage asthma can be challenging for patients. They have a range of triggering events to anticipate, varied medications to take, and multiple methods for doing so, such as choosing from among long-term steroids, quick-relief inhalers and over-the-counter medications.

Patient self-management of asthma requires intensive education, says Kaiser Lim, M.D., a specialist in pulmonary and critical care medicine and lead researcher on the project. “Imagine if we are able to empower our patients by simulation and have them learn vicariously,” he says. “We envision that this phase of patient education will come after the initial teaching sessions, and it will allow patients to synthesize all the information we have imparted.”

Overall, the computer-based experience was positive for users, Dr. Lim says, showing promise as a tool that can help manage disease and control medical costs. “It is well documented that there is an increasing need for innovative educational programs for chronic disease self-management,” he says. “But before we can judge the efficacy of this approach, the usability of these programs must be systematically and rigorously evaluated, and that’s what we’ve begun to do with CASPER.”

This story-based Web-based simulation approach to patient education holds high potential for improving management of other diseases as well. It can be used to address other pressing health problems, such as how to manage insulin, perform exercise, make food choices, and monitor hypertension and congestive heart failure, Dr. Lim says.

To assess the effectiveness of this educational approach, the Mayo researchers recruited 20 patients who had been diagnosed with asthma. The study participants used the computer program with minimal instruction while a usability expert evaluated ease of use. More data from the patients’ experience was gathered through surveys after patients used the computer program and from brief interviews about the

experience.

Results from observing and interviewing asthma patients using the computer education program show that CASPER's strengths include its:

-- Story-based format. Patients generally found the narratives engaging, enjoyable and easy to follow.

-- Use of Q&A structure. This organizational technique helped clarify messages.

-- Ease of navigation. Even without instruction from a person on how to use the computer program, patients generally progressed as intended through the sequence of educational messages.

--Completion rate. Most users finished each asthma scenario as intended.

Researchers also found that several design elements of CASPER need further refinements, such as preventing detours from the intended messages through hyperlinks that distract from the delivery of a consolidated message.

The research demonstrated two main points about improving the effectiveness of patient-centered, computer-based education programs for adult asthma patients:

-- Usability guidelines aren't enough to assure optimal use. Target-audience testing is required, too. Even when the components of design were based on established usability principles, the resulting application still had to be tested by the target audience to fine-tune its operation. Barriers to optimal utilization that emerged in target-audience testing included navigational issues, screen layout, consistency in content and design.

-- A story-based, question-and-answer format is effective and helpful in the patient-centered, computer-based education setting for teaching adults about asthma management. Study participants confirmed the desirability of this approach, reporting that they found the program educational, engaging and entertaining.

Source: Mayo Clinic