Survey respondents wary of robot dentists

By Ginger Pinholster, Embry-Riddle Aeronautical University

An online survey regarding patients’ perceptions of robotic dentistry was one of many Embry-Riddle research projects to be presented during the 2018 International Symposium on Human Factors and Ergonomics in Healthcare conference, March 26-28 in Boston.

In an online survey of 502 individuals (260 female), participants were “significantly less willing to undergo more invasive procedures, such as gum surgery and a root canal, and significantly more willing to undergo procedures such as tooth cleaning or whitening performed by a robot,” reported Stephen Rice, associate professor of human factors.

Moreover, the promise of half-price dentistry increased participants’ willingness to accept dental care from an autonomous robotic dentist, Rice and his graduate students explained at the conference.

In 2017, a robotic dentist in China fitted two dental implants into a woman’s mouth. In addition, a Miami, Fla.-based company, Neocis, announced last year that it had received clearance from the U.S. Food & Drug Administration to introduce a robotically assisted dental surgical system called Tomi.

As robots become increasingly commonplace in many different settings, “It’s important to understand consumer perceptions of autonomous technologies,” said Embry-Riddle graduate student Emily Anania, the lead student author of the HFES poster presentation. “People are not always accepting of emerging technologies. We know from many different studies, for example, that driverless cars and autonomous aircraft technologies cause some people to react with fear or anger. Better insights to those perceptions will be essential in order to increase acceptance of these technologies.”

The Embry-Riddle patient-perceptions survey, completed by Rice and five students on the university’s Daytona Beach, Fla., campus, informed all participants that robotic dentistry is currently being tested. The survey then asked participants to indicate their willingness to have a robot perform 10 separate procedures: teeth cleaning, tooth extraction, root canal, teeth whitening, applying sealant, applying a cap, bonding, gum surgery, applying braces and putting in a filling.

Next, participants were asked similar questions, but with an added incentive: “Imagine that the dentist offers you a half-price discount on all dental work done by a robot in his or her office,” the survey said. “The robot will work autonomously (without human intervention).”

In general, 51 percent of the respondents were moderately or strongly opposed to robotic dentistry, the research group reported. Respondents were particularly wary of invasive procedures like extractions, root canals, and gum surgery, where 66 percent of the participants were moderately or strongly opposed. Female respondents were in general less likely to be willing to accept robotic dentistry, Anania said.

There were two procedures that participants were less negative about, including teeth cleaning and/or whitening; here, only 32 percent of the participants were opposed at full price, and 83 percent were willing to undergo the procedure if the price was cut in half.

Robotic dentists have the potential to improve the precision of different dental procedures, Rice said. Such technology could make dental care more accessible in rural or otherwise underserved areas. Finally, just as aircraft auto-pilot systems allow pilots to focus on safety, Rice added, robots could free up dentists to continuously improve health-care practices and protocols.

The research presented at the HFES conference, “Factors Affecting Consumers’ Acceptance of Robotic Dentists,” was prepared by Rice and Anania, with fellow graduate students Mattie N. Milner, Nadine Ragbir, Matt Pierce and Nathan W. Walters.