Kelly the robot helps kids tackle autism

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Kelly the Robot

Small study found they tended to do better at developing social skills when this 'co-therapist' was used.

(HealthDay)—Using a kid-friendly robot during behavioral therapy sessions may help some children with autism gain better social skills, a preliminary study suggests.

The study, of 19 children with autism spectrum disorders (ASDs), found that kids tended to do better when their visit with a therapist included a robot "co-therapist." On average, they made bigger gains in social skills such as asking "appropriate" questions, answering questions and making conversational comments.

So-called humanoid robots are already being marketed for this purpose, but there has been little research to back it up.

"Going into this study, we were skeptical," said lead researcher Joshua Diehl, an assistant professor of psychology at the University of Notre Dame in Indiana, who said he has no financial interest in the technology.

"We found that, to our surprise, the kids did better when the robot was added," he said.

There are still plenty of caveats, however, said Diehl, who is presenting his team's findings Saturday at the International Meeting for Autism Research (IMFAR) in San Sebastian, Spain.

For one, the study was small. And it's not clear that the results seen in a controlled research setting would be the same in the real world of therapists' offices, according to Diehl.

"I'd say this is not yet ready for prime time," he said.

ASDs are a group of developmental disorders that affect a person's ability to communicate and interact socially. The severity of those effects range widely: Some people have mild problems socializing, but have normal to above-normal intelligence; some people have profound difficulties relating to others, and may have intellectual impairment as well.

Experts have become interested in using technology—from robots to iPads—along with standard ASD therapies because it may help bridge some of the communication issues kids have.

Human communication is complex and unpredictable, with body language, facial expressions and other subtle cues coming into the mix, explained Geraldine Dawson, chief science officer for the advocacy group Autism Speaks.

A robot or a computer game, on the other hand, can be programmed to be simple and predictable, and that may help kids with ASDs better process the information they are being given, Dawson said.

"Broadly speaking," she said, "we are very excited about the potential role for technology in diagnosing and treating ASDs." But she also agreed with Diehl that the findings are "very preliminary," and that researchers have a lot more to learn about how technology—robots or otherwise—fits into ASD therapies.

For the study, Diehl's team used a humanoid robot manufactured by Aldebaran Robotics, which markets the NAO robot for use in education, including special education for kids with ASDs. The robot, which stands at about 2 feet tall, looks like a toy but it's priced more like a small car, Diehl noted.

The NAO H25 "Academic Edition" rings up at about $16,000. (Diehl said the study was funded by government and private grants, not the manufacturer.)

The researchers had 19 kids aged 6 to 13 complete 12 behavioral therapy sessions, where a therapist worked with the child on social skills. Half of the sessions involved the robot, named Kelly, which was wheeled out so the child could practice conversing with her, while the therapist stood by.

"So the child might say, 'Hi Kelly, how are you?'" Diehl explained. "Then Kelly would say, 'Fine. What did you do today?'" During the non-Kelly sessions, another person entered the room and carried on the same conversation with the child that the robot would have.

On average, Diehl's team found, kids made bigger gains from the sessions that included Kelly—based on both their interactions with their

therapists, and their parents' reports.

"There was one child who, when his dad came home from work, asked him how his day was," Diehl said. "He'd never done that before."

Still, he stressed that while the robot sessions seemed more successful on average, the children varied widely in their responses to Kelly. Going forward, Diehl said, it will be important to figure out whether there are certain kids with ASDs more likely to benefit from a robot co-therapist.

Dawson agreed that there is no one-size-fits-all ASD therapy. "Any therapy for a person with an ASD has to be individualized," she said. The idea with any technology, she added, is to give therapists and doctors extra "tools" to work with.

A separate study presented at the same meeting looked at another type of tool. Researchers had 60 "minimally verbal" children with ASDs attend two "play-based" sessions per week, aimed at boosting their ability to speak and gesture. Half of the kids were also given a "speech-generating device," like an iPad.

Three and six months later, children who worked with the devices were able to say more words and were quicker to take up conversational skills.

Dawson said the robot and iPad studies are just part of the growing body of research into how technology can not only aid in ASD therapies, but also help doctors diagnose the disorders or help parents manage at home.

But both Diehl and Dawson stressed that no robot or iPad is intended to stand in for human connection. The idea, after all, is to enhance kids' ability to communicate and have relationships, Dawson noted. "Technology will never take the place of people," she said.

The data and conclusions of research presented at meetings should be viewed as preliminary until published in a peer-reviewed journal.

More information: Autism Speaks has information on autism and technology.