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Telehealth System to Improve Medication Management of Autism Spectrum Disorder Remotely

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Telehealth System to Improve Medication Management of Autism Spectrum Disorder Remotely

Abstract

Approximately 1 in 88 children in the United States are being diagnosed with the Autism Spectrum Disorder (ASD). Autism is a neurodevelopmental disorder that carries with it lifelong physical, emotional, and behavioral consequences. Early diagnosis and treatment can help reduce the severity of the symptoms. To assist healthcare providers in the management of the autism symptoms, a new smartphone application was developed that allows physicians to observe patient behaviors between office visits, and to manage the patient's medication based on the information observed. An evaluation was conducted to determine ease of use of the smartphone application by two physicians and three caregivers of patients with autism. The results showed that the new smartphone application will be able to assist the physician in monitoring patients with ASD more accurately than when only using subjective reports provided by caregivers during office visits. The smartphone application technology promises to help both caregivers and physicians in improving medication management for their autism patients.

The research project was conducted collaboratively between Boise State University and Behavioral Imaging Solutions, Inc. The research protocol was approved by the BSU IRB.

Keywords

Autism Spectrum Disorder (ASD), smartphone, app

Disciplines

Health Information Technology

Telehealth System Supporting Medication Management of Children with Autism

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Background

Approximately 1 in 68 children in the United States is being diagnosed with the Autism Spectrum Disorder (ASD). Autism is a neurodevelopmental disorder that carries with it lifelong physical, emotional, and behavioral consequences. Early diagnosis and treatment can help reduce the severity of the symptoms. To assist healthcare providers in the management of the autism symptoms, a new smartphone application was developed that allows physicians to observe patient behaviors between office visits, and to manage the patient's medication based on the information observed.

Objective

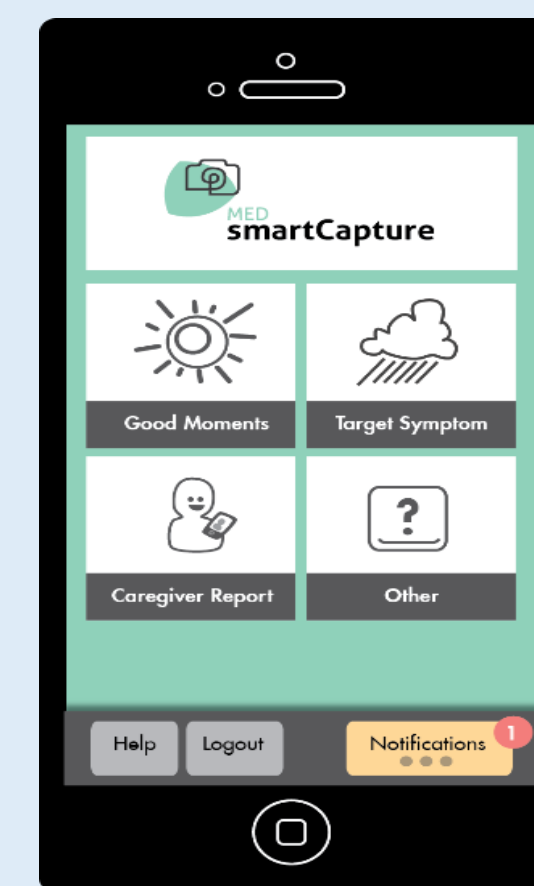
- Obtain feedback from clinician and caregiver volunteers regarding use and convenience of new smart phone application
- Establish updated performance specifications to better assist clinicians in remotely assessing behavioral deficits of children with ASD

Methods and Procedures

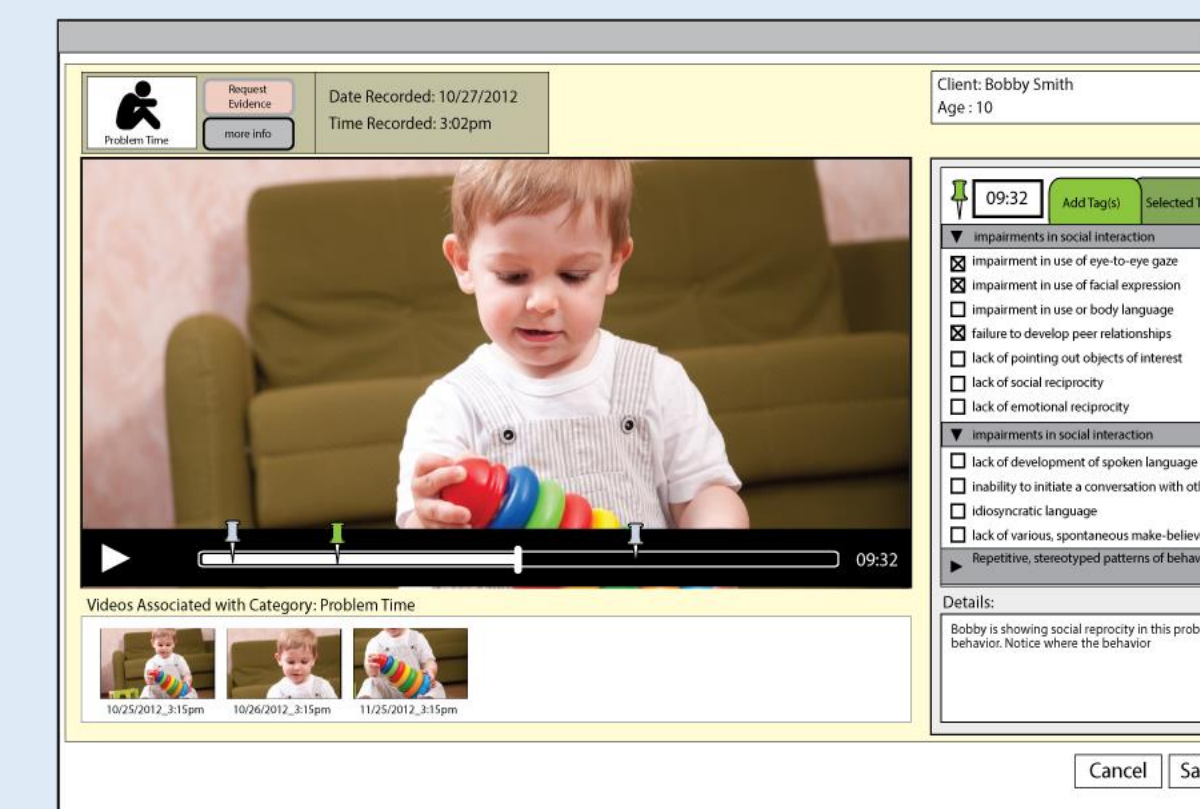
A three month evaluation was conducted involving two clinicians, one caregiver, and two parents of patients with autism. The clinicians "prescribed" the use of the smart phone application with explicit instructions on what and when to capture video data. The caregiver or parent would share the recorded behaviors and upload them via a HIPAA compliant server to the clinician. The clinician would then review and annotate the events of interest for later review, sending text messages to the family if further video documentation was required.

How it Works

Doctor "prescribes" smartphone application to caregiver/parent



Caregiver or parent uploads video data to Doctor via HIPAA compliant server



Doctor reviews video data and annotates events of interest. Doctor can respond via text message to provide feedback or request further video documentation

Conclusions

Feedback obtained in this study was positive and suggests that the smartphone application described here can be incorporated easily into the medication management of autism. The technology may also represent a breakthrough in the management of autism using telemedicine. Additional recommendations include developing a method of integrating the data from the application into an electronic health record system which will allow a doctor to track clinic notes and medication lists, and to facilitate data collection for pharmaceutical trials. The use and value of this system will likely increase as the level of stress experienced by parents and caregivers increases. One of the doctors reported that "user compliance will be greater when parents and caregivers are in distress observing their child's autism symptoms."

Results

- Video clips submitted by the parents and caregiver provided an **accurate depiction of the health status** of the children with autism
- Video clips provided by the parents and caregiver were **helpful in determining the effectiveness** of the medication used in managing the symptoms of the children
- The smartphone telehealth technology provided a **good communication link** between parents/caregivers and the doctor.

- The technology was very **helpful in communicating** with the doctor between office visits
- The technology helped **document accurately** the child's "true" health status
- The smartphone screen quadrants **simplified the understanding** and use of the technology

Doctor Responses

Caregiver and Parent Responses