

Case Report

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Using Technology to Support Self-Care and Communication for Individuals with Autism: Opportunities and Challenges

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ABSTRACT

This paper examines how technology, particularly AI powered tools, can be used to support individuals with autism in improving their self care skills and communication abilities. Traditional method for teaching these skills fall short in addressing unique sensory, emotional and communication challenges that people with autism face, making hard for them to become independent. AI based systems with their structured and consistent approach offer potential solutions. These technologies are limited in their ability to respond to emotional and sensory cues, emphasizing need for human involvement. Through case study of 28-year-old man with autism and limited communication skills, this paper explores how AI when combined with human assistance can enhance self care, communication and overall life quality. Ethical concerns including preservation of dignity during personal care tasks and future advancements for AI in autism care are also discussed.

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Received: October 09, 2024; **Accepted:** October 14, 2024; **Published:** November 04, 2024**Introduction**

People with autism face significant hurdles when it comes to learning basic self care routines and improving communication skills. Sensory sensitivities, communication difficulties and emotional regulation challenges are common issues that make it harder to perform everyday tasks [1]. While traditional teaching methods work for some but they fail to meet needs of individuals with more complex conditions. The paper looks at how technology especially AI powered systems can offer structured support for self care and communication. The case study of 28-year-old man with autism highlights both opportunities and limitations that AI presents in addressing these challenges. While AI offers consistent and predictable form of guidance, it cannot fully address emotional and sensory needs which is why human caregivers remain crucial.

Case Study: A 28-Year-Old Man with Autism

The individual in this case study is 28-year-old man with autism who has limited speech and language skills. His mother (single parent) has been helping him develop self care skills for several years. Because she works full time, finds it difficult to provide consistent prompts and guidance, completing tasks herself which limits his progress toward becoming independent. One of young man main challenges is his sensitivity to his mother perfume. This sensitivity causes him distress particularly in mornings and makes it difficult for him to engage in his self care routine. His mother has observed that when teaching him new tasks or routines, she needs to be patient and emotionally available. If she is rushed, he become emotionally upset and disengages from routine. He can also sense when she is in hurry which further impacts his emotional regulation and makes it harder for him to follow instructions.

In this case, AI based system could offer consistent, neutral prompts for self care routines that helping young man avoid emotional triggers and engage more fully in tasks. AI could help facilitate simple, interactive conversations, reducing his reliance on echolalia (repetitive speech) and improving his communication skills. However, AI system would need to be paired with human caregivers to address young man sensory sensitivities like his reaction to certain smells which AI systems alone cannot currently detect or adapt to.

Dignity of Care and AI Role in Preserving it

One of biggest concerns when using AI to help individuals with autism in personal care tasks is the issue of dignity. For 28-year-old man with autism, having strangers like caregivers help with personal tasks like changing clothes or taking shower can be uncomfortable or even embarrassing. By providing private consistent instructions for self care tasks, AI allow individuals to maintain dignity while working toward independence.

Another issue is individuals with autism face is high turnover rate of caregivers. Many individuals with autism struggle with change and having to adjust to new caregivers can be disruptive and distressing. By integrating AI into personal care routines, individuals like young man in this case study can benefit from consistent guidance without emotional burden of having to adjust to new caregivers. AI can offer stability and support but human caregivers are still essential for providing emotional connection and flexibility.

Over reliance on AI can have its drawbacks. There is concern that relying too heavily on AI might limit development of social and

emotional skills in individuals with autism that making them more robotic or isolating them from human interaction. To avoid this AI should be used as supplement to human care, not replacement.

The Role of Technology in Self-Care and Communication

AI systems can provide structured predictable support for individuals with autism that help them to manage self care tasks and improve communication. These tools reduce anxiety by creating consistent, low sensory environment. For 28-year-old man in our case study, AI system could provide regular reminders to complete tasks like brushing his teeth or washing his hands and helping him to build independence without causing emotional distress. It is important that AI system is used in combination with human caregivers to ensure that emotional and physical support is available when needed.

Expanding beyond self care, AI can enhance communication for individuals with autism. Instead of simply giving commands like "It's time to brush your teeth," AI system could ask "Are you ready to brush your teeth now?" This would provide individual with an opportunity to respond, fostering better communication skills. AI could offer adaptive responses when it detects repetitive behaviors that helping encourage more flexible communication patterns.

There are many new ways technology is helping people with autism especially when it comes to social interaction, communication and learning. Here is how some of these tools can make life easier for those with autism

- **Early Identification:** Technology is helping doctors identify autism earlier than before. Instead of waiting for long periods of observation, doctors can now use tools that analyze things like eye movement or behavior in videos. This allows them to see signs of autism much sooner, meaning children can get support earlier in life which is essential for their development [2].
- **How it Helps:** Early identification ensures that children can get the help they need sooner, improving their chances of developing better communication and social skills.
- **Practicing Social Skills:** Many people with autism struggle with understanding social cues or how to interact with others. New technology, like virtual reality or robots, can help people practice talking to others, recognizing facial expressions and making eye contact in a way that's less stressful. These tools create a safe space to practice these important skills [3].
How it Helps - Over time, these tools have been shown to help people with autism feel more comfortable in social situations and improve their ability to communicate with others.
- **Helping with Communication:** Some people with autism find it hard to speak or communicate their feelings. Special devices are available that help them form sentences or express what they need to say. These tools often predict what someone is trying to communicate, making the process easier [4].
How it Helps - These communication tools give non-verbal individuals a way to express themselves, reducing frustration and helping them connect with others.
- **Tracking and Understanding Behaviors:** For caregivers, it can be hard to know when someone with autism is feeling stressed or about to have a meltdown. Technology is being used to monitor things like heart rate to predict when someone need extra support. This can help caregivers step in before a stressful situation happens [5].
How it Helps - This technology can help prevent outbursts by identifying signs of stress early, making life easier for both the person with autism and their caregivers.
- **Personalized Learning:** Children with autism often have

different learning needs and technology can help by adjusting lessons to their individual pace and style. These tools can change the difficulty level or the way information is presented to keep children engaged in learning [6].

How it Helps - These tools help children stay focused longer and understand what they are being taught, making learning more enjoyable and effective.

- **Sensory and Emotional Support:** Many people with autism are sensitive to things like light and sound. Technology can be used to adjust the environment around them, for example by dimming lights or lowering noise levels if they become overwhelmed. Virtual companions are also being used to offer emotional support, calming individuals during stressful moments [7].
How it Helps - By adjusting their surroundings, this technology helps people with autism feel more comfortable and better able to manage their sensory needs.
- **Support in Therapy:** Technology is also helping people with autism in therapy sessions. There are tools that help with speech therapy, motor skills and emotional management. These tools provide extra practice outside of therapy sessions and track progress over time [8].
How it Helps - These tools provide a way to practice important skills on a regular basis, which leads to improvements in areas like communication and emotional control.

How it Could Help a 28-Year-Old Man

For 28-year-old man with autism, these technological tools could make his daily life much easier. For eg., communication device could help him express his feelings or needs when he has trouble finding right words. Sensory support tools could help him manage his surroundings better, reducing stress that comes from things like bright lights or loud noises. When it comes to personal care, technology could guide him through tasks like getting dressed or taking a shower, allowing him to be more independent and keeping his dignity intact by not always relying on others for help [2,3].

By using technology in this way, the 28-year-old could keep his sense of independence while still receiving support he needs to deal with everyday challenges he faces.

Challenges and Limitations

While AI can offer consistency, it does not have emotional intelligence needed to handle complex human interactions like understanding sensory sensitivities. For eg., the AI would not be able to respond to man sensitivity to smells like his reaction to his mother perfume. The AI also can not adjust to changes in emotional triggers like when his mother is in rush or stressed. This is why human caregivers are still important—they can recognize these emotional and sensory needs and respond to them in way that AI cannot [9].

There is also risk of becoming too dependent on AI systems. If man starts relying too much on AI, it could make his behavior more rigid and stop him from learning how to adapt to changes in his environment which is important skill for real life situations [10]. While AI can offer stability, it is important that system introduces some variety in how it gives prompts or interacts, so man does not get stuck in same routines.

Ethical Considerations

Using AI in autism care brings up some important ethical questions. As AI becomes bigger part of people daily routines and communication, it is necessary to make sure it is used in responsible way. AI should not replace human connection that

individuals with autism need for emotional and social growth. There are also concerns about privacy and data security and whether using AI for long time could reduce person ability to naturally interact with others.

Future Advancements in AI for Autism Care

Looking ahead AI technology should focus on becoming more adaptable and emotionally responsive. For eg. future advancements could make AI better at detecting emotional cues or sensory sensitivities like recognizing change in someone tone of voice or noticing environmental factors like smells. This would improve overall experience for user. AI systems could also be programmed to adjust their responses based on specific needs of individual that making them more flexible and reducing chance of triggering emotional distress.

Discussion

This case study shows that when used properly, AI can improve ability of individuals with autism to manage self care routines and enhance communication skills. Because AI struggles with emotional and sensory needs, human involvement is still essential. For people like the 28-year-old man, AI can offer structure and support but achieving best results also requires emotional support that only caregivers can provide. The potential for AI to help with communication while remaining flexible is promising but it needs to be carefully balanced with human care to prevent over reliance and to encourage adaptability [11-13].

Conclusion

Technology has power to change how individuals with autism handle self care and communication. AI based systems can provide consistent support but they need to be used alongside human interaction to make sure emotional and social development are still happening. As seen with 28-year-old man, AI can offer consistency needed for tasks like self care and communication but caregivers are still vital for achieving best results. Moving forward AI systems should aim to recognize emotional cues and respond to sensory needs in order to offer more complete approach to autism care.

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