Chapter 24
Use of Chatbots to Support the Inclusion of People With Autism Spectrum Disorder

Ayşe Tuna
Trakya University, Turkey

ABSTRACT

It is known that individuals with autism spectrum disorder enjoy interacting with technological tools and enjoying being engaged with them. Because these interactions happen in a trustworthy and safe environment for them. Therefore, this chapter presents how chatbots can help children with autism spectrum disorder, and reviews the advantages and disadvantages of chatbots. In addition, the challenges that limit the use of chatbots and various ethical problems raised by the use of chatbots are reviewed. Finally, future research directions in this domain are presented.

INTRODUCTION

Pervasive developmental disorders (PDD) refer to a group of disorders characterised by delays in the development of socialisation and communication skills. PDD include Autism, Asperger Syndrome,

Childhood Disintegrative Disorder, Rett Syndrome, and PDD Not Otherwise Specified. In the past, diagnosis of PDD was not consistent across clinics. Because the disorders included in PDD term had very similar signs and symptoms. Therefore, Autism Spectrum Disorder (ASD) has been started to use since it encompasses all the disorders included in PDD but relies on a spectrum that differentiates based on the severity of social communication deficits and restrictive and repetitive behaviours/interests/activities.

Stress and confusion is common in parents of children with atypical development. While before the diagnosis the parents may have lots of questions regarding symptoms and screening, after the diagnosis they possibly have questions regarding treatment options. They can easily be frustrated by the news they get and may have lots of questions regarding causes and the child's future. Children with ASD have unique characteristics, including difficulties in social interactions and communication with others. In addition, they have limited or repetitive behaviours, activities and interests (Magnuson & Constantino,

DOI: 10.4018/979-8-3693-2440-0.ch024

2011). Due to these particular characteristics, the management of ASD is a challenging task requiring the use of novel therapeutic approaches suitable for this disorder (Magnuson & Constantino, 2011).

Children with ASD need particular attention; therefore, their parents needed particular training. In this regard, information technology-based tools and machine learning techniques can assist in bridging the gap between the child, the parent, and the physician (Apparao Polireddi & Kavitha, 2023). One of these approaches is chatbots. The first chatbot was Eliza, a therapy bot (Hoover & Spengler, 2023). It was designed in the 1960s at the MIT Artificial Intelligence Laboratory and was modelled on Rogerian therapy, in which a counsellor restates what a client tells them, often in the form of a question (Weizenbaum, 1966; Hoover & Spengler, 2023). Instead of employing arficial intelligence the program relied on repetition and pattern matching. Scripted responses of Eliza gave its users the impression that they were talking to something that understood them (Hoover & Spengler, 2023). Therefore, the users engaged in intense and extensive conversations with the program.

In recent years chatbots with artificial intelligence-driven, scripted responses have been available. Woebot (Fitzpatrick, Darcy, & Vierhile, 2017; Mijwil et al., 2023) is one of those chatbots. It was designed to play the role of an actual therapist and based on cognitive behavioural therapy practices (Rathnayaka et al., 2022). Chatbots were highly demanded throughout the pandemic as more people than ever sought out mental health services. In addition to individuals looking for medical advice, chatbots are used by children who seek help with homework and by people who need everyday companionship. But those chatbots only deliver scripted responses and are generally narrower in scope, ChatGPT's richer conversation can be more effective for individuals that try to work out complex social issues (Hoover & Spengler, 2023).

Robots and artificial intelligence can understand emotions and/or feelings and help users feel more comfortable while communicating their true feelings (Chaturvedi et al., 2023). Because the users realise that they will not be judged (Apparao Polireddi & Kavitha, 2023; Boison et al., 2022). In this context, this chapter both reviews chatbots designed to help children with ASD and delves into design issues and approaches used in these chatbots. In addition, as chatbots may cause various ethical problems, such as misunderstanding users' questions, causing emotional harm and being offensive, and failing to provide the benefits and deliver the service promised (Coghlan et al., 2023; Al-Shahwani et al., 2024), in this chapter ethical issues related to their use are also reviewed.

In this chapter it is aimed to try to address some research questions. First, with their customisable language and communication settings, can social chatbots meet the individual needs of each child with ASD? Second, can social chatbots reduce anxiety and stress levels of children with ASD? Finally, can social chatbots help to improve cognitive and social skills of children with ASD? Relying on a scooping study is the main limitation of this chapter.

AUTISM SPECTRUM DISORDER AND TECHNOLOGY

ASD is a neurological and developmental disorder. Individuals with ASD typically have difficulty with communication and interaction with other people, restricted interests and repetitive behaviours and symptoms that considerably affect their ability to function in school, work, and other areas of life (American Psychiatric Association, DSM-5 Task Force, 2013). Although ASD can be diagnosed at any age, its symptoms generally appear in the first 2 years of life (National Institute of Mental Health, n.d.). Technology can be used to support daily activities, facilitate independence, and provide assistance with occupational skills for individuals with ASD (Khanlou et al., 2021). In recent years, with this goal, vari-