GNA Journal of
Management & Technology

ISSN-0974-572
Vol. 17 No. 1, January-June, 2026

METHODOLOGICAL REVIEW OF ROBOTIC INTERVENTIONS FOR INDIVIDUALS WITH AUTISTIC

Dr. Rajesh Sharma[1], Deepak Kumar[2], Shriya Bassan[3] , Dr. Kapil Dev Goyal[4]

[1]Associate Professor, School of Computational Science, GNA University, Phagwara
Email: rajeshsharma1234@gmail.com

[2] Assistant Professor, School of Computational Sciences, GNA University, Phagwara
Email: Dpak4333@gmail.com

[3] Student, School of Computational Sciences, GNA University, Phagwara
Email: shriyabassan@gmail.com

[4] Assistant Professor, Sant Baba Attar singh Khalsa college
Email: kapildevgoyal@gmail.com

Abstract

Objective: *The study examines the effectiveness of socially assistive robots in improving communication skills, emotional interaction, learning ability, and social participation among autistic individuals.*

Methodology: *A review-based methodology was adopted by analyzing previously published research articles, journals, and conference papers focusing on hospital-based and online robotic systems. Different aspects such as research methods, sample sizes, data collection techniques, and technologies used in earlier studies were critically compared and evaluated.*

Findings: *The findings indicate that robotic interventions have shown positive outcomes in supporting autistic individuals, especially with the integration of artificial intelligence and advanced learning algorithms that improve robot adaptability and reliability.*

Limitations: *However, several limitations were observed, including small sample sizes, short experimental durations, and the absence of standardized evaluation procedures, which restrict the generalization of results.*

Originality: *The originality of this paper lies in its comprehensive comparative analysis of methodologies and technologies, providing useful insights, recommendations, and future research directions for the development of more effective robotic systems for autism support and therapy*

1. INTRODUCTION

Similar to the challenges of social interaction and communication, repetitive patterns of behavior, interests, activities, and limited and inflexible patterns are characteristic of autistic disorder (AD) or merely autism. Differences in sensory finishes can affect the ability of a person to function in a variety of contexts, such as establishing social relationships and performing essential daily tasks. We realize that diagnosis of autistic disorder (AD) requires a particular condition in various areas of life, and therefore is not expected from his age in culture background. Autism is a spectrum that leads to

significant deviations in the representation and support of others in autistic patients. They don't speak illustrations, but others often talk.

Treatment and intervention for autism disorder (AD) has always been dependent on human connection and individualized care. These traditional approaches were effective, but often required considerable time and special training. To improve this, autism-focused robots have been developed as expert tools to provide therapeutic support with the help of simple but effective techniques. These robotic interventions support spectral individuals by performing therapeutic and support functions. People with AD can benefit especially from robots, providing consistent, repeatable, and engaging interactions. Autism robots are not separate from

improving patient outcomes, but also offer a variety of additional benefits, such as improving communication skills, supporting daily life, opportunities and learning, improving communication skills, improving social interactions, and playing.

1.1 Main objective of this research

1. Systematically review and compare existing robotic interventions developed for children with autistic disorder (AD).
2. Distinguishing between the most important technologies and automatic models of machine learning to improve young people with passionate awareness of social interaction, communication and advertising.
3. To highlight the controls in current mechanized systems, especially concerning personalization, long- term flexibility, and real-time enthusiastic engagement.
4. To provide organizational comparative trials that will help future analysts and designers choose adaptive techniques and innovations for automated AD-centric treatments.

This paper examines and compares the methods used in existing studies examining robotic interventions in children with autistic disorder (AD). Based on the literature discussed in the previous section, this work aims to analyze design frameworks, data recording techniques, sample sizes, and outcome measures in a variety of studies. In this way, it not only highlights the strengths and limitations of each approach, but also provides a structured comparison that identifies the patterns of repetition and the practices that are commonly employed. This integration serves as a valuable resource for researchers, practitioners and developers by providing insight into how real applications are done. Ultimately, this paper attempts to determine the most effective and most common techniques for supporting children with AD with robot-based treatments.

2. LITERATURE REVIEW

This article presents research into emotional communication with socially useful robots, particularly for children with autism. From 1997 to 2021, 46 studies were published to examine computational

models of emotions in children with AD, even if not all were for children with AD. These studies suggest that further investigation of emotional social robot computers is necessary. (Cano et al., 2021) This study successfully communicates both verbal and nonverbal to help children with AD. These studies demonstrate a robot-based music therapy platform. This platform has three parts in mind. It is an autonomous autonomous initiative positioning system for robots, a Taylor song module, and a real music therapy experience. The robot uses short-term Fourier transform and Levenstein distance for music recognition and intelligent scoring and feedback. This platform was tested on 9 children with normally developed AD and 7 children, and the results showed a 70% accuracy of motor control tasks and stable rotational behavior (Feng et al., 2022).

This study analyses literature on robotic therapy for autism, better participant characterization, and importance for larger sample sizes. It highlights the importance of robot autonomy, adaptability, personalization, and standardized outcome measures for future research (Santos et al., 2025).

Latest research shows that children with autism can attract interactive robotic therapy. This proves to be an important aspect of human interaction. Reviews of 38 articles on Robot-Assisted Autism Therapy (RAAT) demonstrate the great growth of magazine publications. This indicates an increasing interest in the use of robotics in autism therapy. Factors such as artificial intelligence and machine learning progress have stimulated this growth (Alabdulkareem et al., 2022).

The design and initial evaluation of Jari, a social robot created to improve social interaction and emotional awareness in children with autistic disorder (AD), is featured in this study. Robots that combine mechanical, electronic and software components with modular architectures are manufactured especially for children aged 6 to 8 years old. The system addresses robustness and adaptability needs, character development, and interaction. The research has donated a large research programme examining the potential of SARs to improve the social and cognitive development of AD.(Pakkar et al., 2019).

Inclusion of students with autistic disorder (AD) in the formation of the mainstream is stimulating. Digital technologies such as personalization settings and robot interactions can help AD students. However, it is important to explain each student's profile and needs. The pilot test describes the main requirements of AD students based on behavioral variables. The instruction sequence is used using digital tablets and robotic interactions. Demonstration of results increased improvements in interest, motivation, engagement, and social interaction (Herrero-Martin et al., 2024).

This study evaluated the success of Zoomorphic Robot Brian in the treatment of children with autistic disorder (AD) associated with traditional therapists. The study included 116 treatment sessions with 14 children. The results showed that children with autism showed a willingness to respond to verbal commands and showed better recognition and naming of the emotional states they were shown in the face of the robot and in the face of the robot compared to the human face. This suggests that robots may

be an effective tool to support AD therapy (Szymona et al., 2025).

This research aims to discover the use of social education robots, especially humanoid robots, in high schools, to talk about developmental disorders such as autistic disorder (AD). This study uses the AD student coworking framework. This is an interview with the canvas methodology of business models for robot design and curriculum development and customer discoveries to bridge the gap between academic research and industry development. The research will take part in eight core research offers for high quality learning environments for AD students (Arora et al., 2024).

This study examines robot-supported autism therapy (RAAT) and artificial intelligence (AI) approaches to measure child engagement during treatment sessions. The study included five Arabic-speaking locals, ages.

The robot camera recorded the interactions of children's robots and was subsequently analyzed for commitment. The results showed that the proposed system provides constant accuracy when measuring engagement. This demonstrates the potential of intelligent social robots to support the therapeutic and educational goals of children with autism (A1-Nafjan wt al., 2023).

Patients on the autism spectrum can benefit from robotic interactions because of the possibility of promoting communication and social interactions. Robots act as motivational instruments, can take predictable actions, and make them easier to interact as human partners. However, determining the best conditions for using robots for these people remains a challenge (Dubois-Stage et al., 2024).

This systematic review aims to determine whether educational analysis (ABA) and critical response therapy (PRT) interventions for children with autistic disorder (AD) supported by Robotar Technology. An electronic database and comprehensive search of 13 articles was included. In this review, we categorized the results of ABA vs. PRT and robotic technology compared to humans. This result suggests that robotic assistive technologies are promising, especially in therapeutic contexts with more natural contexts and social hobbies.

Social Support Robots (SARs) are used to recognize anxiety content in children with autistic disorder (AD). This is a disease that is often characterized by difficulty expressing emotions. SAR uses blood pressure monitoring as an indicator to grasp anxiety with a strong correlation between blood pressure and fear. SAR technology can be implemented in schools, special homes, or hospitals. This makes it easier for supervisors and teachers to monitor the health of children without visiting health centers or hospitals (Prihatini et al., 2025).

This scoping check examines AI control education measures for students with autistic disorder (AD). It highlights the transformative potential of AI in improving educational and treatment outcomes. AI control tools such as "Lifeisgame" and "Empower Me" use advanced technologies such as facial recognition and augmented reality to improve social and emotional skills. Voice generation devices and educational robots such as Kaspar and Kiwi have shown promising in the development of

communication skills and social interactions. However, this review determines ethical challenges such as extensive teacher training, data protection concerns, and algorithmic bias. Future efforts should focus on long-term research, standardized ethical AI deployment frameworks, and interdisciplinary collaboration (Habibi et al., 2025).

Robots can help people with autistic disorder (AD) by improving interactions between human robots. The purpose of this study is to develop an automated system for estimating emotional states and to include people with AD with self-infringement questionnaire data. This helps to implement long-term interventions, maintain participants' motivations, and improve the likelihood of robotic interventions (Konishi et al., 2024).

Social robots are increasingly used in health care, including nursing, elderly care, and autism treatment. It is believed to help reduce staffing shortages and improve mental health treatment. However, its application to psychiatry is controversial. Scoping checks of the literature on social robots in adult psychiatry had several positive effects on symptoms, resulting in increased user acceptance. Although evidence for the benefits of robotic interventions in adult psychiatry is limited, larger randomised studies are promising (Kling et al., 2025).

This article checks interdisciplinary research into the potential benefits of social robots in the supply of autism and focuses on clinical validation and implementation. We analyze experimental research, critically discuss integration into health practices to support health professional members in determining opportunities and limitations, and fostering interdisciplinary collaboration (Vagnetti et al., 2024).

A study involved in Table 1 involving experts in online surveys, pilot studies, was conducted to help experts design storytelling with Playware Technology (OPT) to support children with autistic disorder (AD). The game promotes emotional recognition through the Triad setup involving robots, children and researchers. This study showed that children understood the game mechanisms and successfully interacted with new Optopts. The results show that using technology in support meetings can improve commitment and support in children with AD (Silva et al., 2024).

Table 1: Study of online Survey

Author(s) & Year	Model/ Method	Data Collection	Data Sample Size	Result
S. Cano, C. S. González(2021)	PRISMA guidance Computational model	Multiple academic databases	46 studies (1997 to 2021)	Huge computational models used for SARs, but most fail to fulfil emotional and social needs of children with AD. The study emphasizes the need for improved emotional interaction models and better recognition and response mechanisms to enhance affective communication.

Feng (2022) et al	Positioning and Instrument play, Customized Song Play, Music Therapy Experience	Electrodermal (EDA) and Human Robot (HRI) session. Activity Structured Interaction	9 AD children (average age ~11.73 years), 7 Typically Developing (TD) children (average age ~10.22 years), 50 HRI sessions conducted.	In motor control tasks, the majority of participants showed 70% accuracy. Six of the nine participants with AD exhibited consistent turn-taking behaviour. Support Vector Machines (SVM) for emotion classification demonstrated that EDA signals could identify emotional arousal in children with AD.
Laura Santos et al (2023)	Various robotic models for AD therapy	Literature review from Web of Science, PubMed, Scopus	146 studies reviewed	Identified key challenges and gaps in robotic therapy research
E. P. M. Ruiz, H.H.O. Fernández,C. E.G.Cena, (2025)	JARI Robot, designed for children with AD	Tests for identifying emotions, behavioural observations, and structured questionnaires	11 children (10 boys, 1 girl) with minimal or no-verbal communication and 7 children (5 boys, 2 girls) with verbal communication.	Children used physical gestures to interact with JARI. Maintaining eye contact with the robot.
Roxanna Pakkar, Caitlyn Clabaugh et al (2020)	Socially Assistive Robot (SAR) for extended use at home	Collecting data in home over a month using observation analysis and structured interviews.	Eight children with AD in six different homes	Most children developed strong relationships with the robot. Reports indicate that the robot was amiable and beneficial for communication. The speech and movements of the robot were disliked by one participant. Some children eventually demonstrated increased social connectedness and a propensity to study.
J.Herrero-Martín, D. Fonseca, S. Caro-Via, and X. Canaleta	NAO Robot intervention for AD student	Observation analysis, expert evaluation, structured interviews.	11 students (aged 5-13) in an inclusive education setting	Personalized profiling served as tailor intervention. Engagement and motivation levels up. Better social interaction with friends.
B. Szymona et al. (2025)	Zoomorphic Robot Brian	Each child participated in four session with the robot and four session with a therapist daring the 166 treatment sessions that were held.	14 children	Enhanced involvement, enhanced emotional awareness, enhanced social interaction, and increased imitation

A. S. Arora, A. Arora, K. Sivakumar, and J. R. McIntyre (2024)	Social Educational Robots (NAO & Pepper Robot) Business Model Canvas (BMC) Framework Robotic Intervention Scenarios (SEL skills: Comfort Zone, Conflict Resolution, Job Search)	Customer Discovery interview, HRI Field Experiments. Interviews with school administrators, teachers, parents, robotic company professionals Multiple robotic intervention sessions	25 AD Student, teachers. 35 stakeholders 16 AD students 9	Enhanced involvement, interpersonal communication, and emotion nal awareness created a curriculum for ethical robotics and improved teamworkImproved understanding, social-emotional learning, and constructive involvement.
A. Al-Nafjan, N. Alhakbani, and A. Alabdulkareem (2023)	Therapist Observation A. Assessment. NAO Robot Interaction	Video recordings of therapy sessions using NAO Robot Manual evaluation using behavior-based assessment sheet Social interaction scenarios designed with ABA specialists	5 Arabic-speaking autistic children (ages 4-11) 5 autistic children 5 autistic children	Accurately and successfully categorised involvement levels to help therapist evaluations Provided reliable engagement scores, aligning closely with CNN resultsChildren with AD showedincreased interaction and involvement.
E. Prihatini et al. (2025)	Socially Assistive Robot(SAR)	Blood Pressure Monitoring(MP S20N0040D sensor)	5 patient	accurately gauges anxiety levelsby measuring blood pressure.
S. Konishi et al(2024)	Light GBM (machinelearning algorithm)	Multimodal data: audio, motion, gaze, and self-administered questionnaires	25 participants with AD(22 males, 3 females, avg.age = 22.8, avg. IQ =94.04)	Better assessment of emotions (AUC values rose with data from self-administered questionnaires)

3. METHODOLOGY

This study uses a comparative analytical approach to systematically evaluate and contrast the methods used in existing studies within the target domain. The overview focuses on key parameters such as data collection methods, sample size, research methods, and analysis methods. Through a critical review of these dimensions in several studies, this paper identifies patterns, strengths, limitations and gaps in the current research environment. Although it does not work with its own methodological framework, this analysis integrates various strategies to provide a comprehensive overview. The aim is to lead future research by highlighting the most effective and most commonly assumed practices that support the selection of the best methods for subsequent research.

3.1. Research Goal

The main goal of this review is to critically analyze and examine the methods used in selected studies used in autistic disorder (AD). The focus lies in aspects such as data collection methods, sample size, research models, and analytical techniques. Although only empirical studies using well-defined methods are considered, review work has been intentionally excluded to maintain the analytical integrity of thecomparison. This comparative analysis aims to identify the most effective and reliable research practices for future research in this field. To facilitate this, a structured comparison table has been developed. This classifies each study based on its method/model, data recording method, sample size, and important results. This structured approach allows clear and concise comparisons and helps researchers decide the most appropriate and effective way to promote future work in the field of AD research.

3.2. Data Sources

By B. Elfonel Canco claims to have gathered information from a series of databases, including IEEE Xplore and Web of Science. They used key terms such as "robot", "children", and "autism" in keyword-based searches . Feng from Elle claims that he collected data from experimental conferences for children with autism and young people with typical development. Nine candidates with AD and seven candidates with TD are managed at HRI meetings' . Laura Santos claims that information is retrieved from three major databases: Web of Science (WOS), Pubmeb and Scopus. We examine these studies in this study using key terms such as autism and robotics . E. P. M. Louis. Fernum Ades and C E. G. Cena claims that two educational institutions used data from pilot reviews. It is a Spanish integrated school and a special school in Peru. Both qualitative and quantitative methods were used in this study ' . Caitlyn Clabaugh et al. According to Roxanna Pakkar, data from a one-month home study was conducted in six different homes with eight children with autism disorder (AD). This study pursues daily interactions between children with autism and children with kiwi robots to determine social growth, access management and research findings . According to J. Herrero-Via and X Canareta. Eleven basic and secondary students with autism disorder participated in this study. This also included children with autism (intensive support for comprehensive education) that is part of the ISIE programme' . B. Szymona et al. In this study, 14 children with autism participated in 116 treatment conferences' . A. S. Alora - £££Jã£R. McIntyre has collected interviews and customer data from discovering BMC technology (business model screen) focused on stakeholders involved in student inclusion with education students. With educators from a variety of educational settings, including teachers, parents, school administrators, technology leaders, robotics industry experts, and advertising students —' . A. Al-Nafjan, N. Alhakbani, A. Alabdulkareem. These five autistic youths who are sufficient at age 4-11 speak Arabic. Using integrated cameras from NAO humanoid robots, researchers confirmed the interactions between children's robots. Facial expressions were then

assessed to measure different stages of participation– . Data from blood pressure measurements in children with autism disorder (AD) from the Gentaralam SLB Autism Foundation are E. Prihatiniet al. This study examined the fear levels in children with Asperger's syndrome and classical autism based on digital surfaces integrated into social support robots (SARs) . According to S. Konishi et al. We summarized 25 people with autism disorder (AD) who provided the data used in this study. In a controlled environment, research participants conducted simulated interviews with Android robot interviewers. Researchers trained machine learning models that collected multimodal data and predicted emotional states and commitments, including audio, movement, considerations, and survey responses " . This section analyzes and compares data collection methods used in existing literature. This analysis shows the method of data collection, the sources used, and sample sizes specified for each study. The purpose of this review paper is to compare these studies and identify the most effective approach.

4. RESULT

Based on comparative analysis of existing methods, it is clear that LightGBM, a gradient boost algorithm for machine learning, is the most effective approach to robotics developed for interaction with individuals on the autism spectrum. This conclusion is based on consistent performance in terms of accuracy, scalability and adaptability in a variety of studies. LightGBM not only allows real-time learning, but also processes complex, high-dimensional data that is extremely important for understanding and predicting behavioral patterns in people with autism.

In my view Figure 1, a machine-based model based on reviews of all previous studies is a particularly promising methodology for robotic interventions in autism therapy. These models allow personalized data control interactions by learning from historical patient records and behavioral data. This makes it suitable for improving social, emotional and cognitive support from adaptive robotic systems.

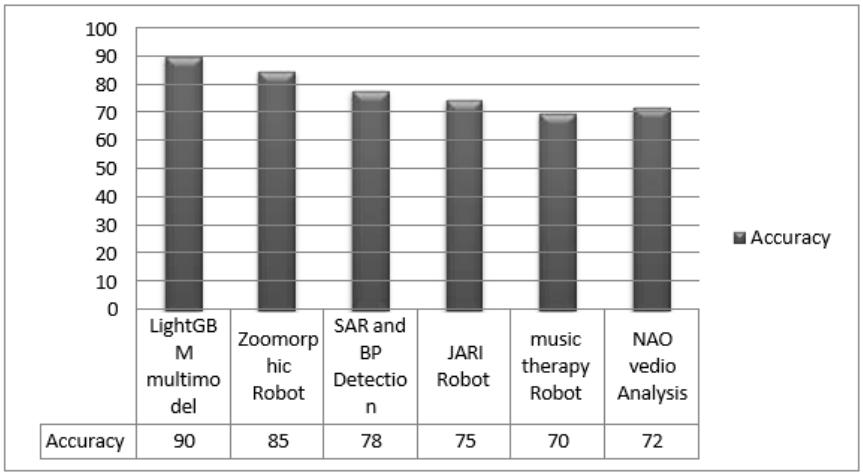

Figure 1: studies is a particularly promising methodology for robotic interventions in autism therapy

Our review paper demonstrates the effectiveness of self-development survey data in machine learning models to predict emotional estimation in children with AD. This review was analyzed using the LightGBM model, a machine learning ensemble algorithm based on gradient boost and production (GBDT). This method is done with higher accuracy, faster training speeds, and lower memory consumption compared to other methods.

Also, mention how self-managed survey data has improved performance. We also show significant improvements when the value, excitement, valence, commitment, and the data above involved in the area under the curve (AUC) affect classification. Because we gave the highest AUC values through the training model using a variety of data, such as audio, motion, and eye data, and survey inputs. The eyedata used only had poor performance, but when combined with audio and movement data, better management estimates were stored. Here, we need to mention important results through receiving the highest AUC (0.81, not just 0.04) through the combination of all data and self-managed questionnaire data. When using movement-based characteristics, classification is improved with the help of self-managed questionnaire data. The model includes audio, motion and Gaza data for best classification performance.

These results are highlighted by these findings, particularly for robot-based AD interventions. Self-report reviews must be included in the Machine Learning (ML) tax rating system to include machine learning. According to this study, personalized classification of emotions can help future robotic interaction models enhance long-term therapy and improve social engagement outcomes (Konishi et al., 2024).

5. CONCLUSION AND DISCUSSIONS

This comparative analysis shows that robotic interventions in children with AD represent promising and rapidly developing fields. The excellent performance of the LightGBM-based machine learning approach, especially combined with multimodal data, including self-reported measurements, provides a clear direction for future technological development. Evidence shows that these systems can effectively support communication, social interaction and emotional regulation in children with autism.

However, this field faces considerable challenges that need to be addressed to exploit its full potential. The need for larger, more different research, standardized results, and long-term follow-up is important. Additionally, ethical considerations, implementation barriers and careful attention to cost-effectiveness are essential. As this technology continues to mature, it promises to significantly improve outcomes for people with AD, while at the same time reducing stress in their families and health systems.

Future research should focus on fighting identified restrictions and build on the promising fundamentals determined by current research. In this way, this field can move towards evidence-

based, technically sophisticated and ethically sound interventions that truly serve the various needs of the autism community.

Although the journey towards effective robotic intervention for AD continues, the evidence presented in this analysis indicates that we are moving in the right direction. With continued research, technological advancements and attention to ethical considerations, robotic interventions.

REFERENCES

Al-Nafjan, A., Alhakbani, N., & Alabdulkareem, A. (2023). Measuring Engagement in Robot-Assisted Therapy for Autistic Children. *Behavioral Sciences, 13*(8). https://doi.org/10.3390/bs13080618.

Alabdulkareem, A., Alhakbani, N., & Al-Nafjan, A. (2022). A Systematic Review of Research on Robot-Assisted Therapy for Children with Autism. *Sensors, 22*(3), 1–16. https://doi.org/10.3390/s22030944.

Arora, A. S., Arora, A., Sivakumar, K., & McIntyre, J. R. (2024). Managing social-educational robotics for students with autism spectrum disorder through business model canvas and customer discovery. *Frontiers in Robotics and AI, 11*(April), 1–17. https://doi.org/10.3389/frobt.2024.1328467.

Cano, S., González, C. S., Gil-Iranzo, R. M., & Albiol-Pérez, S. (2021). Affective communication for socially assistive robots (SARs) for children with autism spectrum disorder: A systematic review. *Sensors, 21*(15). https://doi.org/10.3390/s21155166.

Dubois-Sage, M., Jacquet, B., Jamet, F., & Baratgin, J. (2024). People with Autism Spectrum Disorder Could Interact More Easily with a Robot than with a Human: Reasons and Limits. *Behavioral Sciences, 14*(2). https://doi.org/10.3390/bs14020131.

Feng, H., Mahoor, M. H., & Dino, F. (2022). A Music-Therapy Robotic Platform for Children With Autism: A Pilot Study. *Frontiers in Robotics and AI*, 9, 1–23. https://doi.org/10.3389/frobt.2022.855819.

Habibi, F., Sedaghatshoar, S., Attar, T., Shokoohi, M., Kiani, A., & Malek, A. N. (2025). Revolutionizing education and therapy for students with autism spectrum disorder: a scoping review of AI-driven tools, technologies, and ethical implications. *AI and Ethics, 5*(3), 2055–2070. https://doi.org/10.1007/s43681-024-00608-1.

Herrero-Martín, J., Fonseca, D., Caro-Via, S., & Canaleta, X. (2024). Development of personalized profiles of students with autism spectrum disorder for interactive interventions with robots to enhance language and social skills. *Frontiers in Psychiatry, 15(November)*, 1–10. https://doi.org/10.3389/fpsyt.2024.1455627.

Kling, M., Haeussl, A., Dalkner, N., Fellendorf, F. T., Lenger, M., Finner, A., Ilic, J., Smolak, I. S.,

Stojec, L., Zwigl, I., & Reininghaus, E. Z. (2025). Social robots in adult psychiatry: a summary of utilisation and impact. *Frontiers in Psychiatry, 16(February)*, 1–12. https://doi.org/10.3389/fpsyt.2025.1506776.

Konishi, S., Kuwata, M., Matsumoto, Y., Yoshikawa, Y., Takata, K., Haraguchi, H., Kudo, A., Ishiguro, H., & Kumazaki, H. (2024). Self-administered questionnaires enhance emotion estimation of individuals with autism spectrum disorders in a robotic interview setting. *Frontiers in Psychiatry, 15*(February), 1–11. https://doi.org/10.3389/fpsyt.2024.1249000.

Madrid Ruiz, E. P., Oscanoa Fernández, H. H., García Cena, C. E., & Cedazo León, R. (2025). Design of JARI: A Robot to Enhance Social Interaction in Children with Autism Spectrum Disorder. *Machines, 13*(5), 0–23. https://doi.org/10.3390/machines13050436.

Pakkar, R., Clabaugh, C., Lee, R., Deng, E., & Mataricc, M. J. (2019). Designing a Socially Assistive Robot for Long-Term In-Home Use for Children with Autism Spectrum Disorders. *2019 28th IEEE International Conference on Robot and Human Interactive Communication, RO-MAN 2019.* https://doi.org/10.1109/RO-MAN46459.2019.8956468.

Prihatini, E., Damsi, F., Marniati, Y., Muslimin, S., Husni, N. L., Ramadhan, M. D., & Caesarendra, W. (2025). *Recognizing Anxiety in Autism Children through Blood Pressure Monitoring with a Socially Assistive Robot*. Atlantis Press International BV. https://doi.org/10.2991/978-94-6463-678-9_37.

Santos, L., Annunziata, S., Geminiani, A., Ivani, A., Giubergia, A., Garofalo, D., Caglio, A., Brazzoli, E., Lipari, R., Carrozza, M. C., Ambrosini, E., Olivieri, I., & Pedrocchi, A. (2025). Applications of Robotics for Autism Spectrum Disorder: a Scoping Review. Review *Journal of Autism and Developmental Disorders, 12*(3), 455–476. https://doi.org/10.1007/s40489-023-00402-5023-00402-5.

Silva, V., Pereira, A. P., Soares, F., Leão, C. P., Jurdi, A., Sena Esteves, J., & Hertzberg, J. (2024). Social Stories for Promoting Social Communication with Children with Autism Spectrum Disorder Using a Humanoid Robot: Step-by-Step Study. *Technology, Knowledge and Learning, 29*(2), 735–756. https://doi.org/10.1007/s10758-023-09681-7.

Szymona, B., Jaworska, M., Matyjasek-Koc, A., Zygmuntowicz, M., Karpiński, R., Dębińska, I., Kuszta, P., Szymona, K., Niderla, K., & Maciejewski, M. (2025). Robot-mediated therapy: Emotion Recognition and Social Skills Trainingfor children with ASD. Analysis of the use of Zoomorphic Robot Brian - preliminary reports. *Current Problems of Psychiatry, 26,* 37–46. https://doi.org/10.12923/2353-8627/2025-0004.

Vagnetti, R., Di Nuovo, A., Mazza, M., & Valenti, M. (2024). Social Robots: A Promising Tool to Support People with Autism. A Systematic Review of Recent Research and Critical Analysis from the Clinical Perspective. *Review Journal of Autism and Developmental Disorders, 2016.*