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ORIGINAL

Autism Spectrum Disorder from a Psychological Lens: Cognitive, Emotional, and Social Factors

El trastorno del espectro autista desde una perspectiva psicológica: Factores cognitivos, emocionales y sociales

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ABSTRACT

An intricate, varied illness called autism spectrum disorder influences interactions with others, nonverbal and verbal communication, thinking, comprehension of information, and social as well as cognitive behaviours. The study of the Theory of mind focuses on seeing, comprehending, and analysing mental events and the actions that follow from them. Research examines the cognitive, emotional, and social aspects of autism spectrum disorder via a psychological lens. The current study concentrates on how mind theory relates to the psychological, social, & cognitive growth of kids with autism spectrum disorder. The results of this investigation emphasize that there is a relationship between the Theory of mind and how well a -person's psychological, social, and cognitive abilities work. Hence, deficiencies in a kid's social interactions and intellectual and cognitive abilities systems are related to the restricted growth are observed in Mind Theory which has seen in autistic children. As a consequence, a viable alternative treatment technique involves taking a concentrated, comprehensive approach to their shortcomings while also using information and communication technologies.

Keywords: ASD; Mind Theory; Cognitive Growth; Psychological; Behavioural Changes.

RESUMEN

El trastorno del espectro autista es una enfermedad compleja y variada que influye en las interacciones con los demás, la comunicación verbal y no verbal, el pensamiento, la comprensión de la información y los comportamientos tanto sociales como cognitivos. El estudio de la teoría de la mente se centra en ver, comprender y analizar los acontecimientos mentales y las acciones que se derivan de ellos. La investigación examina los aspectos cognitivos, emocionales y sociales del trastorno del espectro autista a través de una lente psicológica. El presente estudio se centra en cómo la teoría de la mente se relaciona con el crecimiento psicológico, social y cognitivo de los niños con trastorno del espectro autista. Los resultados de esta investigación ponen de relieve que existe una relación entre la teoría de la mente y el funcionamiento de las capacidades psicológicas, sociales y cognitivas de una persona. Por lo tanto, las deficiencias en las interacciones sociales de un niño y los sistemas de habilidades intelectuales y cognitivas están relacionadas

con el crecimiento restringido se observan en la Teoría de la mente que se ha visto en los niños autistas. En consecuencia, una técnica de tratamiento alternativa viable consiste en adoptar un enfoque concentrado e integral de sus deficiencias, utilizando al mismo tiempo las tecnologías de la información y la comunicación.

Palabras clave: TEA; Teoría de la Mente; Crecimiento cognitivo; Cambios psicológicos; Cambios conductuales.

INTRODUCTION

A behavioural condition known as an autism spectrum disorder (ASD) impacts a person's lifelong propensity for openness with society.[1] The signs of ASD first appear in infancy and continue through teens and young adults. Recurrent actions are a feature of those suffering from Autism, and analyzing such actions will aid in the creation of a strategy for detection at an early stage.[2] The range of actions shown by individuals with Autism varies according to age and capacity. Poor conveying movements, inability to respond to hearing, inability to make correct eye contact, no sensation of pain perception, repeating of phrases, and growing irritated with changes in everyday tasks are among those behavioural abnormalities often seen in individuals with autism spectrum disorder. Family members with Autism are fifty times more likely to get Autism than healthy individuals are. In addition, men are four to five times more likely than girls to be impacted with Autism. In accordance to the World Health Organization, 1 in 170 individuals worldwide is at risk of having autism spectrum disorder at any one moment. This is an increase from 2020, when it was predicted that one out of every 54 kids had autism. It was thought that one in 150 kids had autism around 20 years ago. There can be a variety of variables behind this rising quantity. Figure1 represent the autism prevalence rate over years from 2004 to 2020. Figure 1 represents the Autism prevalence Rate.

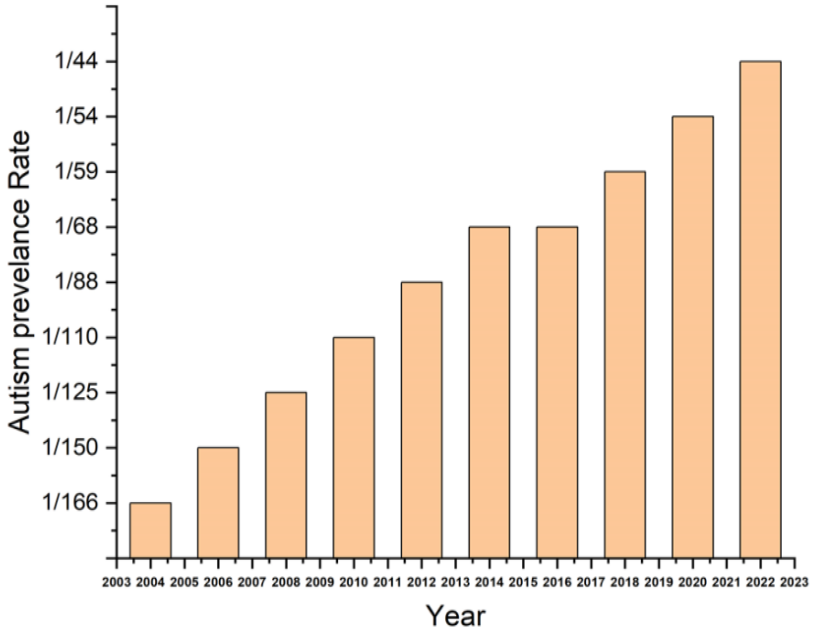

Figure 1. Autism prevalence Rate

Improvements in autism awareness, responses, and attempts to reach the underserved population are some of the contributing causes. Although Autism can't be completely treated, early recognition of its indications might assist to lessen its impact. A glimmer of hope for detecting the onset of ASD based on numerous behavioural and physiologic signs is offered with the use of machine learning in the foreseeing and identification of different illnesses with outstanding precision. Autism is difficult to identify and analyse since there are additional mental illnesses with comparable signs and symptoms, which can lead to instances of false positives.[3] Multiple investigations have shown that, in comparison to their parents of usually maturing children and parents of children with various developmental conditions, families of children with Autism feel a higher degree of anxiety. Parents who have kids with Autism experience particular difficulties, and it relies on a number of variables on how well they are able to manage higher levels of pressure.[4] The study of the Theory of mind focuses on seeing, comprehending, and analyzing mental events and the actions that follow

from them."Structural equation modelling "was used to evaluate if controlling emotions and interpersonal interaction were linked to self-harm and stereotypical actions for 239 autistic people and their values are examined.

Related works

Research [5] utilized three connected operational medical record sets from the Combined Information Network to find young people and kids in New Zealand who had ASD. Then, we looked at how much a variety of psychological, growth-related, and other issues Autism co-occurs. [6] examined the events that were common before confinement, showing that kids and teens with Autism benefited from spending a greater amount of time with their families, developed new skills, and took part in traditional family activities in quarantine. Research [7] proposed "ASD-DiagNet "has been launched out to help distinguish between individuals with Autism and healthy individuals by just fMRI data. Formulated and put into practice a team-based learning technique combining an automatic encoder and a "single layer perceptron, "which enhances the level of characteristics retrieved and optimizes the model's parameters. Research [8] looked into the effectiveness of robots as assistive technology (AT) learning tools for children with autism spectrum disorder (ASD). The project seeks to determine if robots as assistance tools may (i) significantly boost academic attainment and (ii) provide important learning experiences for this group of youngsters. Research [9] investigated the associations between Eating disorders and Autism spectrum disorder symptoms in people with a lifelong history of Anorexia nervosa by using network modelling. Research [10] evaluated using a combination method that combines deep neural networks with Explainable intelligent technology to identify the characteristics that are most important for the accurate and initial forecasting of Autism. Research [11] examined in 62 households with children with Autism if effective parent responding was connected to lower bonds among higher levels of a child's signs and symptoms and associated problems with externalization and worse parental responses to baby negative feelings. Research [12] Evaluated how moms of autistic children evaluated social assistance, paternal psychological investment, and other aspects of their psychological wellness. Research [13] evaluated the efficacy of Effective functions therapies given to kids and teens having a diagnosis of autism spectrum disorder in "randomized controlled studies or quasi-experimental research".

METHOD

A systematic review of the research was conducted for this investigation using a few different bibliographical files, including Research Gate, Google Scholar, the Scopus database, PubMed, & ERIC. It is also an overview of works since it is the right technique to gather as well as put together prior studies to further understand. The vast majority of the papers in the present research are on young children and adolescents from start to finish.

Theoretical background

By Understanding other individuals' intellectual and mental conditions and being able to deduce and anticipate their actions is made possible by the Theory of Mind (TOM), a sophisticated mental process. For control of social situations, it is crucial and closely tied to awareness of oneself.[14] The capacity to see the direct connection between our own and other individual states of mind and the conduct they produce is known as the TOM. With regard to the most effective analysis of Theory, all three hypotheses must be combined. The field of developmental psychology lists three primary conceptual perspectives that method its feature: "Theory for Theory, Theory of Mental Simulation, & Modularity Theory "."TOM" is a crucial social-cognitive skill that progressively emerges around the ages of 3-6 and has an impact on many parts of a child's life.[15] Two-year-olds have a fundamental comprehension of feelings, thinking, wants, and purpose. Around the age of 5-6, youngsters start thinking erroneously, testing out novel ideas as they learn from their observations and rewriting the old ones. Yet as verbal and executive abilities are developed, a gradual method for constructing habits and analyzing the substance of ideologies emerges. Four-year-olds' actual activities are related to their ability to recognize incorrect ideas, which indicates a progression in their intellectual growth. Nevertheless, the children's achievements on fabricated tests is a procedure whose conclusion is impacted by how they perceive things, executive function, mental comprehension, and intellectual, social, and personal variables related to Theory. According to the study, there are two structures: one is quiet and unconscious, emerges early, and is linked to the observation of cognitive processes; the second, which takes time to grow, operates in a purposeful, regulated way and permits clear, which means conscious judgments.[16] Additionally, we differentiate between a person's cognitive TOM, which results in judgments about the intentions and ideals of other people, & the sensitive TOM, which needs the contribution of sympathy & is essential for the comprehension of feelings.

Autism

Autism is a neurological condition with unidentified origins. The Greek word "autós" (which literally translates as "self") is where the word "autism" originates.

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Main features of ASD

Social interaction and stereotyped routines, hobbies, and interests are two major groupings of indicators that serve as a good description of the deficiencies of ASD. Display issues with ecological impact, self-care abilities, and body awareness in the distance, motor control, and responsiveness to varied stimuli from the environment. The formation of visual symbolic language acquisition, resolving issues retention, reaction-restriction, visual-spatial abilities, interest, and emotional and social development are other areas where deficiencies have been observed.

Diagnosis

The disease can be identified at any age but is often diagnosed in children shortly after the age of two. It follows the patient all throughout life and has an impact on how well he or she functions, interacts with others, behaves, and communicates with them. The variations in diagnosis, multidisciplinary, growing, and prompt identification of unique metrics, like health, hereditary, and external variables, are essential for the verification and customization of the evaluation, but also for the improvement of clinical descriptions of people.

Intervention

Individuals with Autism need multifaceted and tailored treatment and instruction that addresses numerous areas of their growth and aims to improve their independence and standard of living while also providing the necessary parental support. Although there is no cure for Autism, early diagnosis and therapy can help to improve brain structure, operation, and actions, avoiding or delaying the emergence of serious signs for the rest of an individual's life.

Causes

Regarding the factors that contribute to it, Autism is a multifaceted disorder. The most important reason for this happening, yet, is the interplay between genes and early external factors that affect growth. Numerous types of research have supported the idea that comorbidity in the cognitive systems of infants with genetic susceptibility to ASD is one of the primary causes of the illness and that aggravation is brought on by external contaminants.[17]

Social development

The human eventually picks up information via observing, imitating, and involvement in social relationships through a variety of social systems that function effortlessly and explicitly. The socio-emotional growth of a person is made up of a variety of complicated talents that are gradually developed via environmental inquiry and life events. The existence of some fundamental cognitive skills, such as inquiry, thinking, focus, recall, and correct interpretation of social communications, as well as interaction with others, is also assumed by socio-emotional capability. According to research, we can differentiate between 4 fundamental abilities in a person's social-emotional growth: social skills, psychological ability, the capacity to control problems with behaviour, and autonomy.

Cognitive development

A collection of mental operations required for the structuring and comprehension of information are referred to as cognitive. One of the most important stages of development in the initial two years of a child's existence is the acquisition of a skill that offers fundamental knowledge regarding the world, particularly the method for mental representations. Cognitive growth is a long process that calls for the integration and interaction of both cognitive and emotional abilities, which helps the person adapt. As an elevated mental activity, cognitive processing refers to consciousness, assessment, and management of how one thinks, as well as an understanding of how one's cognitive abilities work. According to studies, kids who have ASD need to improve their capacity for metacognitive thinking in instruction to improve their executive functions, social skills, and Concept of Mind. Perception, which is recall, focus, studying, growth in language, motor skills, and visual-spatial skills, are examples of basic intellectual skills. A cognitive mechanism that encourages social contact is also linked to the growth of executive function, which is involved in planning, directing, and tracking behaviour toward an objective.

Correlating Autism with Theory Of Mind

Individuals in the autism spectrum have trouble understanding and differentiating between their own and other people's states of mind. Specifically, in the initial pertinent examination, autistic children lacked TOM, and they discovered impairments. It was discovered, in specific, that their degree of social apathy and restricted growth of the metaphorical game are related to their mental deficiency in TOM, which is mainly

irrespective of their cognitive years. TOM is defined as the capacity to convey mental conditions via a process called "initiation and expression" that converts main illustrations into subordinate representations that are divorced from actuality & articulated as new portrayals.

Theory of Mind in Children

TOM is necessary for societal participation, interpersonal interaction, and, probably, language learning and comprehension. The growth of TOM requires thinking, higher cognition, and connections between neurons. The social setting coordinates and activates the baby's TOM, which is not completely established. TOM evolves via the societal brain's awareness of faces, speech, and actions. The kid's involvement in the figurative game, recognizing that others performance out, & the capability to imitate what other persons do are initial indications of TOM growth. They begin to understand erroneous beliefs, dishonesty, and lying at age 8.

TOM in autistic children

Many autistic persons have strong cognitive talents but Tom deficiencies. The mind impairment idea describes how autism-related postponed growth in TOM affects children's comprehension and appraisal of others' actions, which might appear weird and unexpected. In the initial year of life, kids who have ASD have trouble following others' gaze, showing their interests, and sharing focus. They also don't like the looks of others, because they're not sociable. As adolescents become older, individuals have trouble detecting and interpreting complicated emotions, particularly mental state-related ones, which affects managing behaviour, social interaction, and social skills. Deficits are seen in their understanding of the initial and second-rate erroneous beliefs, deceit, and cheating, which they utilize but struggle to sustain, and symbolic behaviour, which helps them comprehend others. They also struggle to read people's emotions and grasp "faux pas tests". They also struggle with narrative texts since they can't grasp each character's ideas, emotions, and acts. Autism affects children's growth and mental capacities. In summary, Tom might be used to assess the extent of ASD and provide assistance, allowing for social-communication growth via suitable activities.

ASD children's social-emotional development and TOM

Recognition, understanding, and expression of emotions

Feelings that dominate psychological intelligence are a physiological process that interacts with other brain processes to help the person grow and adjust. Infants' initial language is their facial expressions. While autistic children can communicate feelings, their inconsistent gestures render them hard to understand.[18] They are unable to convey their emotions or synchronize them with their speech. Kids with autism spectrum disorders, no matter their age or cognitive level, have difficulties recognizing, expressing, and understanding social and psychological information from facial expressions. Due to TOM and empathic deficiencies, this limits participation in society and comprehension of others' complicated emotions and behaviours. Research suggests children with Autism have trouble understanding feelings owing to a shortage of visible awareness of primary facial characteristics, which convey comparable feelings, or a deficiency in short digesting inputs when they interchange fast. A therapy program for kids and teens with Autism improved primary recognition of emotions, expressing yourself, and expansion of similar skills, resulting in Tom.

Sensitive Regulation of autism children in Relative to TOM

Empathy is the capacity to comprehend another' opinions and feelings from their viewpoint, distinguish feelings, and manage behaviour using intellectual and behavioural abilities. Empathy for cognition includes comprehending a different individual's viewpoint and the cognition-emotional aspect of TOM, whereas emotional sympathy uses emotional feelings. Particular variations have been studied in high-functioning autistic kids' self-management and classroom social interaction. It found that inhibitory control, shared focus, control of emotions, and kids' lower flexibility to pick appropriate socio-emotional coping methods hindered social engagement. Kids with autism spectrum disorders with good mental effectiveness and spoken language were better at interacting, regulating their feelings, comprehending others' thoughts, empathizing with and adjusting to different social conventions empathetic.

Societal Ability of Autism Related to TOM

Social ability social conduct and collaboration with others is based on social understanding, which is a collection of cognitive and psychological skills. Social engagement, interpersonal interaction, and developing abilities are key. Ways to attain individual or collective goals in social circumstances when kids with autism struggle and need TOM abilities. Joint focus, which is linked to social thinking and the growth of the neurological system, is particularly weakened among kids with ASD. By knowledge of oneself and approval, persons with Autism could create good communication connections with others by cultivating interpersonal interaction and recognizing their abilities as well as their shortcomings. According to the study, kids who have ASD and poor

psychological health have trouble understanding others' ideas and emotions, limiting their social relationships. Oral-speaking children performed better socially. TOM comprehension, rather than age or growth in language, is linked to a kid's peer interaction. TOM skills are used in social interactions, moulding the children's relationships with others. Autism also delays TOM and social abilities as well.

The impact of Theory of Mind (ToM) on cognitive development among children with ASD

Multiple investigations use TOM, central unity, and executive processes in explaining the intellectual disabilities of kids on the autism spectrum, along with "islets of skill" like improved recall, excellent visual-spatial capacity, and their drastically distinct mental levels. TOM and executive abilities interact strongly and are important for certain functionality growth and progression. Naturally, the Understanding Systemizing Theory has two aspects that attempt to explain Autism's social & non-social traits. The communication and social deficiencies, limited empathy, and systematizing explain repetitive conduct, restricted interests, intense attention to detail, aversion to change, and the craving for sameness.[19] Systemizing predicts and understands the inanimate cosmos defined by laws, unlike empathy, which improves social perception and interpretation. The extreme male brain hypothesis of Autism also highlights gender disparities in sympathy and systemizing. In specific, females do well on sympathy tests than men do on organizing tests. Therefore persons with autism display organizing strategically processing of data and behave as a portion of the masculine brain profile.

Language capacity

Autism affects communication as well as language, particularly in social circumstances. Since effective interaction requires language acquisition to exchange emotions, ideas, and opinions, they struggle to start and keep a discussion going. These social-communication deficits are linked to recognized problems in the growth of TOM. Social speaking requires actual awareness, which helps youngsters grasp words and phrases above their literal meaning. The above language level is poor in high-functioning Autism. Central cohesion problems, Tom deficits, inhibitory control, flexibility in thinking, and low social drive result from a failure to incorporate data about the environment.

Ability to pay attention

A particular connection is present between intellectual, cognitive, and emotional concentration. Attention, a metacognitive activity, influences all functions, notably executive abilities. Paying attention, especially during synchronizing processing of data, makes people socially and intellectually versatile. Executive functions and Tom are strongly related. An individual's ability to watch and react willingly is vital for comprehending his and other people's states of mind. It discovered that controlling one's thoughts improves executive skills and predicts general growth in children with and without ASD.

Capacity of memory

Through its short retention and processing of memories, the memory that works helps develop cognitive skills such as language acquisition, studying, and thinking. Communicates with concentration to preserve and modify illustrations and stimuli-related data. These impairments could affect behavioural management, flexibility of thought, focus, critical thinking, interaction, problem-solving, and acquiring knowledge.

Alternative ASD treatments with information and communication technologies

Alternate treatments

ASD's cause is unclear due to its heterogeneity. Scientific consensus favours genetic-environmental interaction. Chemical and other treatments are used. Drugs partially ameliorate symptoms of autism spectrum disorder or control comorbidity symptoms. However, its adverse consequences and restricted holistic therapy have led caregivers, investigators, and professionals to alternate autism treatments. Nearly of the bestshared therapies for kids with ASD are "Practical Psychological Evaluation", "LEARNING program"," The PECS interaction system", "MAKATON language improvement communication database", "SPELL support structure, and physicalcombination". These therapies are, focusing on language acquisition, social abilities, abstraction, sensation configuration, self-determination, and social adjustment. "Naturalistic Developmental Behavioural Interventions" (NDBI) that teach small children with autism spectrum disorders communaltalents at their stage of development are beneficial. ICTs help special education to overcome challenges. CT-based special education integrates psychology, neurology, and digital learning. Technology, programs, augmented and virtual settings, handheld technology, robots, and internet applications help persons with ASD learn, socialize, and work.

Use of computer

The computer's obvious social signals help autistic children's conduct and socialization. It also boosts emotional perception, attention, and recall of novel scenarios. Technology can help autistic youngsters because

of its accuracy. They reduce tension and self-stimulatory activities, enhancing concentration, focus, and interaction. “Computer-assisted technology “aids mental comprehension, social growth, growth in language, and ToM. “Mind Analysis” & “Sentiment Coach” help identify emotions and explain the circumstances.

Virtual environment

Virtual worlds simulate actual life social settings. It removes unnecessary inputs and makes learning easier via play. They are regarded as a dynamic and stimulating educational environment that supports creative teaching and benefits ASD youngsters. Simulations using instructional situations decrease stress and increase creativity, conceptualization, and social awareness. Virtual reality experiences may range from desktop apps to immersive laboratories with multifaceted environments.

Mobile phones

Mobile smartphones and tablets help persons with ASD watch, manage, regulate their actions, and minimize distress by effectively executing daily tasks. Mobile apps promote interaction, linguistic, social, and emotional well-being, and literacy. Mobile phones with animation, video content, and graphics are more appealing to kids than typical educational resources.

Use of Robots

Robotics alleviates anxiety and improves mental, emotional, and social growth in autistic children. Robotic understanding seems promising and helps ASD kids with cognitive and sensory issues. Robots teach kids psychological and social abilities, including self-control, concentration control, and awareness, which are crucial for self-awareness. “Socially Assistive Robots “can improve kids who have Autism’s interaction with others, shared attention, and motor abilities by imitating and interacting with educators.[20]

RESULT AND DISCUSSION

This research briefly described TOM’s socio-emotional and intellectual links. “Tom” is a complicated intellectual “tool” needed for societal acceptance and adaptability. Its progression impacts people’s growth, causing deficiencies in relations with others, social capacity, functioning, and overall standard of life. Understanding beliefs is crucial for good social conduct and the development of social abilities, which are required for incorporation into society. Autism weakens the Theory of mind, the mental processes of comprehending, interpreting, predicting, and manipulating behaviour via investigation, which distorts the present social context. Poor regulation of emotions and social interaction was specifically related to self-harming behaviours and repetitive behaviours, respectively. Self-injury, stereotypes, and emotion management were marginally linked. Autism’s unpleasant state of mind typically manifests in those actions. Autism patients may benefit from managing and social interaction treatments. Mean and standard deviations for different characters are presented in table 1 and depicted in figures 2 and 3.

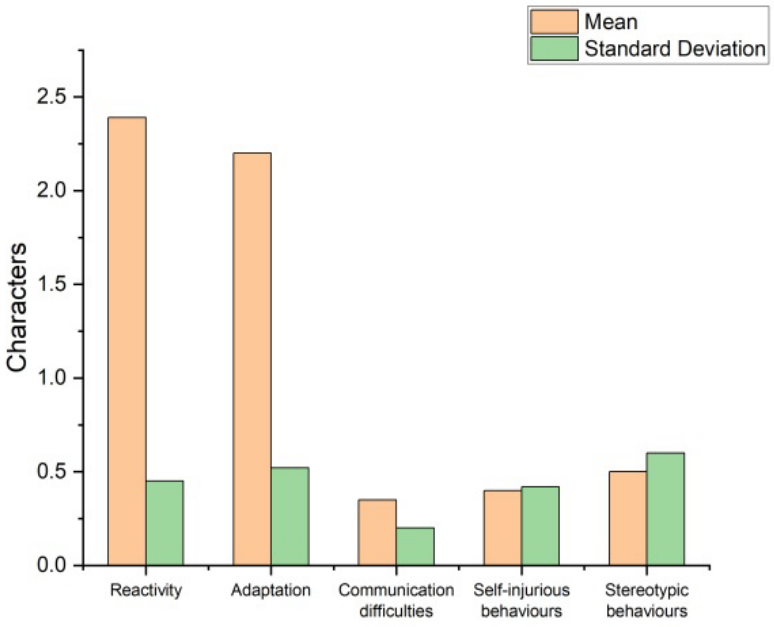

Figure 2. Means and standard deviations of different scales

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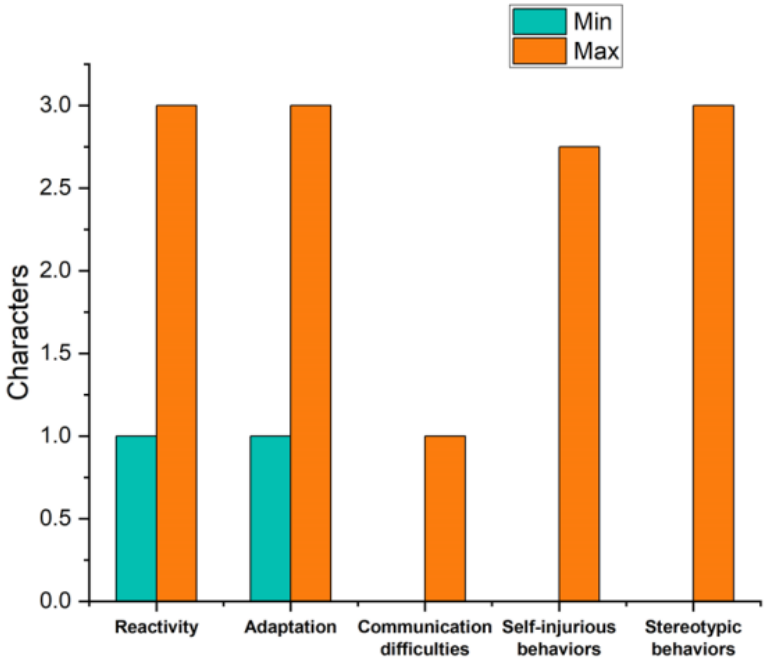

Figure 3. Maximum and minimum values of different scales

Table 1. Averages and standard deviations for the study variables

Parameters	Mean	Standard Deviations	Minimum	Maximum
Framework	1,98	0,61	1	3
Attitude	2,27	0,58	1	3
Sensitivity	2,32	0,55	1	3
Transformation	2,25	0,56	1	3
Speech barriers	0,43	0,27	0	1
Self-inflicted injuries	0,41	0,48	0	2,74
Repetitive behaviors	0,57	0,67	0	3

Thus, autistic children need social engagement, interactions, and psychological growth. Particularly, the diminution of "TOM" in kids with Autism struggle in communication and interaction with others which are essential for improving the durability and improvement of executive functions and the whole intellectual process as the person gains well-interacting with their surroundings as shown in table 2.

Table 2. Simple correlations among various studied parameters

Parameters	Framework	Attitude	Sensitivity	Transformation	Speech barriers	Self-inflicted injuries
Framework	0,65	0,48	0,75	-0,37	-0,44	-0,48
Attitude	-	0,47	0,63	-0,23	-0,35	-0,37
Sensitivity		-	0,62	-0,47	-0,37	-0,45
Transformation			-	0,38	-0,42	-0,57
Speech barriers				-	0,33	0,40
Self-inflicted injuries					-	-0,57

CONCLUSION

Cognitive abilities, particularly higher intellectual abilities, restrict Tom's development and progression. The breakdown of the arousal that produces a variety of feelings and functions in recall, focus, and decision-making, is linked to emotional deterioration in children with Autism. Kids perceive, attend, and observe sensory inputs to gather data. They subsequently retain a portion of the data in their minds in order to anticipate, determine,

and attribute actions and conduct to them self and others' state of mind. Thus, higher intellectual processes, emotional and social development abilities, and TOM function interact mostly. Mechatronics incorporates the fields of computer science, technological devices, technology, and information and communication technologies. Thus, it improves eye contact while socializing, interaction, linguistic understanding, and expressiveness. Thus, modern technology helps kids who have Autism, and Tom improves intellectual and interpersonal skills due to the mind's flexibility, early detection, and treatment for kids with Autism correct deficiencies in numerous areas. Multiple investigations have found that children with autism spectrum disorders perform differently in executive, interpersonal, and Tom skills depending on their field of employment, their difficulty, the importance of autism symptoms, linguistic ability, emotional ability, and logical growth. Given the role of cognitive as well as social processes in the growth of Tom and their interplay, multimodal treatment for kids with Autism must address developmental deficiencies. However, reflection, devotion, employed memory, community interaction, & self-regulation are essential abilities for socio-emotional, intellectual, and mental process growth, especially TOM. As a result of adverse reactions and emphasis on signs and symptoms, medication therapy for ASD impairments is best avoided. By emphasizing ICT for autism treatments, appealing organized multimedia interactions may promote children's intellectual and social-emotional growth.

REFERENCES

1. Papadopoulos D. Mothers' experiences and challenges raising a child with autism spectrum disorder: A qualitative study. Brain sciences. 2021 Mar 2;11(3):309.

2. Kuroda M, Kawakubo Y, Kamio Y, Yamasue H, Kono T, Nonaka M, Matsuda N, Kataoka M, Wakabayashi A, Yokoyama K, Kano Y. Preliminary efficacy of cognitive-behavioral therapy on emotion regulation in adults with autism spectrum disorder: A pilot randomized waitlist-controlled study. Plos one. 2022 Nov 23;17(11):e0277398.

3. Amaral DG, de Vries PJ. COVID-19 and autism research: Perspectives from around the globe. Autism research. 2020 Jun;13(6):844-69.

4. Rolle L, Gullotta G, Trombetta T, Curti L, Gerino E, Brustia P, Caldarera AM. Father involvement and cognitive development in early and middle childhood: A systematic review. Frontiers in psychology. 2019 Oct 25;10:2405.

5. Bowden N, Thabrew H, Kokaua J, Audas R, Milne B, Smiler K, Stace H, Taylor B, Gibb S. Autism spectrum disorder/Takiwātanga: An integrated data infrastructure-based approach to autism spectrum disorder research in New Zealand. Autism. 2020 Nov;24(8):2213-27.

6. Mumbardo-Adam C, Barnet-López S, Balboni G. How have youth with Autism Spectrum Disorder managed quarantine derived from COVID-19 pandemic? An approach to families perspectives. Research in developmental disabilities. 2021 Mar 1;110:103860.

7. Eslami T, Mirjalili V, Fong A, Laird AR, Saeed F. ASD-DiagNet: a hybrid learning approach for detection of autism spectrum disorder using fMRI data. Frontiers in neuroinformatics. 2019 Nov 27;13:70.

8. Arshad NI, Hashim AS, Ariffin MM, Aszemi NM, Low HM, Norman AA. Robots as assistive technology tools to enhance cognitive abilities and foster valuable learning experiences among young children with autism spectrum disorder. Ieee Access. 2020 Jun 11;8:116279-91.

9. Kerr-Gaffney J, Halls D, Harrison A, Tchanturia K. Exploring relationships between autism spectrum disorder symptoms and eating disorder symptoms in adults with anorexia nervosa: A network approach. Frontiers in psychiatry. 2020 May 12;11:401.

10. Garg A, Parashar A, Barman D, Jain S, Singhal D, Masud M, Abouhawwash M. Autism spectrum disorder prediction by an explainable deep learning approach. Computers, Materials & Continua. 2022 Jan 1;71(1):1459-71.

11. Alostaz J, Baker JK, Fenning RM, Neece CL, Zeedyk S. Parental coping as a buffer between child factors and emotion-related parenting in families of children with autism spectrum disorder. Journal of Family Psychology. 2022 Feb;36(1):153.

12. Sarwar F, Panatik SA, Jameel HT, Wan Mohd Yunus WM, Muhamad SN. Psychological capital, social support and

wellbeing in mothers of children with autism spectrum disorder. Sage Open. 2022 Sep;12(3):21582440221121773.

13. Pasqualotto A, Mazzoni N, Bentenuto A, Mule A, Benso F, Venuti P. Effects of cognitive training programs on executive function in children and adolescents with autism spectrum disorder: a systematic review. Brain sciences. 2021 Sep 27;11(10):1280.

14. Clausi S, Olivito G, Lupo M, Siciliano L, Bozzali M, Leggio M. The cerebellar predictions for social interactions: theory of mind abilities in patients with degenerative cerebellar atrophy. Frontiers in Cellular Neuroscience. 2019 Jan 8;12:510.

15. Chahin SS, Apple RW, Kuo KH, Dickson CA. Autism spectrum disorder: psychological and functional assessment, and behavioral treatment approaches. Translational pediatrics. 2020 Feb;9(Suppl 1):S66.

16. Goncalves AM, Monteiro P. Autism Spectrum Disorder and auditory sensory alterations: a systematic review on the integrity of cognitive and neuronal functions related to auditory processing. Journal of Neural Transmission. 2023 Mar;130(3):325-408.

17. McMahon CM, Linthicum M, Stoll B. Developmental disability vs. neurodiverse identity: how cognitive lens affects the general public's perceptions of autism. Disability & Society. 2022 Oct 13;37(9):1439-55.

18. Alkire D, Warnell KR, Kirby LA, Moraczewski D, Redcay E. Explaining variance in social symptoms of children with autism spectrum disorder. Journal of Autism and Developmental Disorders. 2021 Apr;51:1249-65.

19. Ludlow AK, Giannadou A, Franklin A, Allen PM, Simmons DR, Wilkins AJ. The possible use of precision tinted lenses to improve social cognition in children with autism spectrum disorders. Vision Research. 2020 May 1;170:53-9.

20. Cano S, González CS, Gil-Iranzo RM, Albiol-Pérez S. Affective communication for socially assistive robots (sars) for children with autism spectrum disorder: A systematic review. Sensors. 2021 Jul 30;21(15):5166.

21. Martínez-González AE, Cervin M, Piqueras JA. Relationships between emotion regulation, social communication and repetitive behaviors in autism spectrum disorder. Journal of Autism and Developmental Disorders. 2022 Oct;52(10):4519-27.

CONFLICTS OF INTEREST

None.

FINANCING

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