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Additionally, Devescovi et.al., (2016) investigated the impact of the Early Start Denver Model on toddlers with ASD for 15 months, they found that there were statistically significant improvements in the language and cognitive domains. Regarding the severity of autism symptoms, children at a younger age at diagnosis were positively associated with greater improvement at the post- assessment.

Contrary to this study, according to Zachor et.al., (2007) fifty children with a mean age of approximately 2.5 years old diagnosed with ASD were examined from 2 early intervention programs (Eclectic- Developmental and Applied Behavior Analysis). They were not different in their cognitive abilities as measured by their pre- and post- intervention IQ tests. However, improvement in core autistic features was noted, including improvement in reciprocal social interaction after 1 year of intervention.

Conclusion:

Based on the results of this study the use of the implementation of an intervention program for children with ASD is an effective therapeutic method in allowing significant improvement in the IQ scores prior to and after the intervention, therefore, indicating a promising improvement in cognitive skills. Therapeutic outcomes were significantly more in males than in females. Severity levels of ASD also decreased proposing that rehabilitation assists to minimize the symptoms of autism.

Recommendations:

This study provides some evidence of notable improvement in IQ scores in children with ASD after receiving intervention for 6 months. However, further research with larger sample sizes as well as assessing each gender in isolation should be conducted. Additionally, longitudinal studies should be conducted to monitor improvements across various domains throughout the years.

Overall, professionals should be alerted to the importance of early diagnosis of ASD and intervention for children to minimize degree of core symptoms.

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There is a significant difference between IQ Scores (pre) and IQ Scores (post) with respect to all children (p= 0.002) after receiving the rehabilitative intervention.

When comparing IQ pre- and post- intervention with respect to gender, it was significant in males 0.009 however, in females it was comparable.

Table (2) Comparison of pre and post- tests for ADOS Comparison score

Ados- 2	Pre Mean± SD	Post Mean± SD	P- Value
The Group	9.40±. 71	7.48±. 96	<0.001**
Males	9.50±. 6 1	7.55±. 8 9	<0.001**
Females	9.00±. 1.00	7.20±1.30	0.001*

The difference is significant for all children(p≤ 0.001) as well males (p≤ 0.001) and females (p= 0.001).
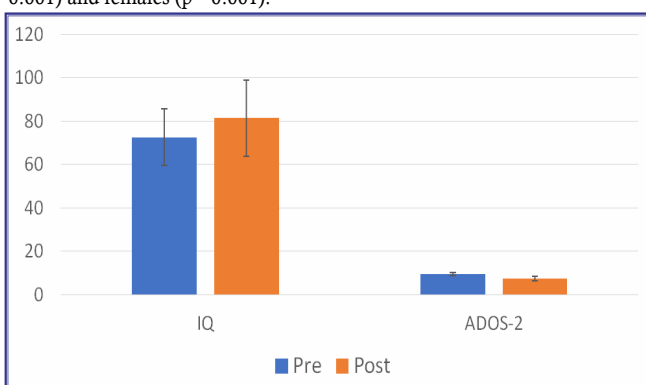

Figure (1) Comparison between pre and post- intervention results of IQ and ADOS- 2 testing for the group of children
IQ: p= 0.002* R= 0.705 ADOS- 2: p= 0.001** R= 0.563.

Table (3) Relation between IQ and ADOS

IQ/ Ados	R	P- Value	Statistics
Pre- Intervention	−0.1 65	0.429	N. S.
Post- Intervention	−0.3 04	0.139	N. S.

N.S.: Not significant

There is no significant correlation between pre and post- intervention in IQ and ADOS.

Table (4) Correlation between pre and post- intervention

IQ	R	P- Value	Statistics
IQ pre/ IQ post	0.705**	0.000	S.

S: Significant

There is a highly significant correlation between pre- IQ and post- IQ R= 0.705.

Table (5) Correlation between ADOS pre and ADOS post

ADOS	R	P- Value	Statistics
Ados Pre/ Ados Post	0.563**	0.005	S.

S: Significant

There is a correlation between ADOS pre and ADOS post R= 0.563, and p= 0.005.

Table (6) Severity level of ASD pre- and post- intervention

Level Of Asd	Pre- Intervention		Post- Intervention	
	Frequency	Percent	Frequency	Percent
Low	0	0	1	4
Moderate	2	8	9	36
High	23	92	15	60
Total	25	100	25	100

In the pre- test, 92% (23 children) were high- level ASD and 8% were moderate. In the post- testing 60% (15 children) were high, 36% were moderate and 4% were low.

Discussion:

The first outcome of this study was the total scores obtained by the Autism Diagnostic Observation Schedule- 2 (ADOS- 2). It is the most recent version and is universally used as a diagnostic tool for ASD. The Carolina Curriculum for Pre- schoolers with Special Needs (Johnson- Martin, et.al., 1990) rehabilitation program did affect the symptom severity of ASD positively based on the ADOS- 2.

Contrary to our current work, Descovi et.al., (2016) evaluated the effectiveness of the Early Start Denver Model (ESDM)- inspired intervention program on a group of toddlers (18- 61 months old) with ASD (diagnosed with ADOS- 2). They found no significant difference in the entire group between prior or after the intervention, although a reduction in the severity of symptoms was mentioned. The difference between the current work and their results was the difference in the age range, in addition to the type of IQ assessment used (SB5) and intervention program used (CCPSN).

In line with our work, a study by Mazza et.al. (2021) on adolescents receiving therapy revealed that independently of the treatment, the individuals with ASD showed diminishing levels of ASD severity. In our study, similar findings we found that the mean of the ADOS- 2 comparison scores decreased for the entire group from pre- test versus the post- test. The majority began at a severe level of ASD making up 92% of the children, the other 8% were of moderate severity. In the post- test only 60% were severe, 36% were at a moderate level, and 4% were at a low level.

The second outcome obtained was related to IQ levels which were obtained before and after rehabilitation, according to Peters et.al., (2011) statistically, significant differences in favour of comprehensive EIBI (Early and Intensive Behavioral Intervention) were reported in 11 reviewed controlled studies for full- scale IQ scores in children aged 10 years or younger with ASD. They had an average IQ range from 27.5 to 76.5. In our study, we found that the mean IQ in pre- testing was 72.6 and 81.3 for post- testing. In contrast to the previous studies, Magiati et.al. (2007) reported a two- year follow- up of 16 preschoolers treated with an eclectic range of EIBI programs in autism- specific nurseries. While children improved in their mental age scores in that study, IQ standard scores were unaffected after receiving therapy.

Supporting our study, Wang et.al., (2012) implemented an early intervention program for children with ASD with ages ranging from 17- 36- month- old. The findings revealed that the support received impacted the children positively regarding their language, and social skills. Also, Rikards et.al., (2009) conducted a study on 59 children with ASD, aged 3- 5 years old, they all showed improvement in aspects of cognitive development after receiving intervention for 1 year. In a study by Dawson et.al., (2010) which was performed on 48 children diagnosed with ASD between 18 and 30 months of age found that after 2 years of intervention, the children in their study showed also significant improvements in IQ, adaptive behavior, and diagnostic status.

Background:

The current population prevalence of ASD is estimated at approximately 1.5% in developed countries around the world (Baxter et.al., 2015) with impediments across variable contexts including social reciprocity, non- verbal communicative social gestures, with the presence of repetitive, restricted behavior patterns, interests, and activities. Within the ASD diagnosis, individualized characteristics are noted, and specifiers are used by clinicians to formulate and communicate a descriptive diagnosis of the affected individual (APA, 2013; 2022).

To date, it remains uncertain as to whether the increased rates of diagnosis correlated to the expansion of the diagnostic criteria of the DSM- V to include sub- threshold cases, increased awareness, variances in study methodologies, or a definite and true increase in the frequency of ASD (APA, 2013; 2022).

Visuospatial processing was relatively spared in high- functioning children with ASD, while deficits were observed in attention, executive functions, language, learning, memory, and sensorimotor processing. (Narzisi et.al., 2013). According to Rabiee et.al., (2020), the most common weakness found in cognition is WM.

The neuro- typical brain is a dynamically organized structure, in a study performed by Karunakaran et.al., (2020) the autistic brain was assessed using fMRI; more folds and a thicker cortex in its neuro function were visible. In the study, receptive and expressive language, visual, and fine motor impairments were seen during the early stage of children.

The current work was aiming to construe a general cognitive profile found in ASD by following an intervention program through evaluating the impact it had on cognitive skills development.

Patients:

The study enrolled 40 children, due to a lack of sufficient data or dropping out, the study was conducted on 25 children diagnosed with mild- severe Autism Spectrum Disorder according to the DSM V and ADOS- 2. The children attended the outpatient center for 6 months.

1. Inclusion Criteria:
   a. Age range: (3- 7) years old.
   b. Gender: Both Sexes.
   c. Cases diagnosed as peruse of the DSM- V- TR, and ADOS- 2.

2. Exclusion Criteria:
   a. Co- morbid psychiatric disorders.
   b. If the child is under the effect of any medication affecting nervous system development.
   c. Any other developmental risk factor (prenatal, natal, and postnatal) which affects growth, cognitive and motoric development.
   d. Other neurological or genetic disorders that affect mental and motor development.

3. Ethical Considerations: Ethical considerations according to the research ethics committee both in Ain Shams University and Faculty of Postgraduate studies.

Methods:

Children in the group were subjected to the following protocols:

1. Detailed Medical History: Focusing on the age of onset, course, and duration of symptoms. Also on social, communication, and behavioral delays. The severity of symptoms, developmental, family, past, prenatal, natal, and post- natal history was also noted.

2. Clinical psychiatric evaluation using the DSM- V- TR, then psychometry using the ADOS- 2 (Lord et.al., 2012), showing deficits in social communication and interaction severity levels ranging from mild to severe. Restricted, repetitive patterns of behavior, and limited interests/ activities were apparent. The symptoms must have arisen during the early developmental period impeding social, communicative, and occupational functioning.

3. Assessment of cognitive abilities through:
   a. First Autism Diagnostic Observation Schedule- 2 for the severity of the diagnosis.
   b. First cognitive evaluation: children were subjected to an evaluation of cognitive abilities through Stanford Binet Intelligence Scales, Fifth Edition (Roid et.al., 2012) assessment.
   c. Carolina Curriculum (CCPSN; (Johnson- Martin, et.al., 1990) screening to develop a plan for intervention for the period of 6 months.
   d. Second cognitive evaluation: children were subjected to a second evaluation of cognitive abilities through Stanford Binet Fifth edition intelligence quotient assessment after 6 months of intervention.
   e. Second ADOS- 2 evaluation.

Statistical Analysis:

The collected data were organized, tabulated, and analyzed using the statistical package for the social science (SPSS) version 2.0 IBM (2017). The data were presented as numbers and percentages from qualitative data, mean, standard deviations, and ranges for the quantitative data. T- test was used to compare the frequency of qualitative variability and post- intervention. For all tests, a probability of $(p<0.05)$ was consistently significant.

Results:

� Descriptive Statistics: The current work was carried out on 25 children (20 boys and 5 girls) ages ranging from (3- 7) years old diagnosed with mild- severe ASD. The mean age was 5.1 years old (the male mean age was 6.1 years old with an SD of 0.9 and the female mean age was 3.4 with an SD of 1.1).

� Comparative Statistics: data in this study was collected in the form of SB5 IQ results and the ADOS- 2 results.

Table (1) Comparison between Pre- and post- intervention IQ scores

SB5	Pre Mean± SD	Post Mean± SD	P- Value
The Group	72.60± 13.18	81.32± 17.58	0.002*
Males	68.25± 10.23	77.05± 16.80	0.009*
Females	90.00± 8.43	98.40± 7.64	0.095

Significant at p≤ 0.05

Cognitive Profiles in Children with Autism Spectrum Disorder

After Receiving Six Months of Rehabilitation

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Summary

Background: Cognitive profiles vary in Autism Spectrum Disorder (ASD) and to date remain a controversial topic. As cognitive abilities contribute to the severity of the spectrum, it is crucial to attempt to comprehend the impact of these abilities on the overall prognosis of ASD. Therefore, it will be targeted by the implementation of a rehabilitative program (CCPSN) and then assessing the cognitive abilities and ASD severity level after receiving 6 months of intervention.

Aim: The study is aiming to determine the improvement of cognitive profiles using Stanford Binet 5 (SB5) on children with ASD after receiving intervention/ rehabilitation for 6 months. .

Patients& Methods: An intervention prospective study was carried out on a sample of 25 randomly selected ASD Egyptian children, ranging from the ages of (3- 7) years old, who were seeking support at a Special Needs Center during the period from January 2021 to January 2022. Children were subjected to a semi- structured Clinical Psychiatric Interview twice (including the DSM 5- TR and the ADOS- 2), Stanford Binet 5 first, then they followed an intervention plan based on the CCPSN for 6 months and reassessed. .

Results: There is a significant statistical difference between pre and post IQ Scores with respect to all 25 children (p= 0.002) following the cognition- enhancing rehabilitative program. Regarding the ADOS- 2 the difference was also significant for all children (p= <0.001) especially males (p= <0.001) versus females (p= 0.001).

Conclusion: The implementation of an intervention program to improve cognitive abilities in children with ASD is considered an effective therapeutic method for enhancing cognitive aptitude. Such a significant outcome was more evident in males than in females. .

Keywords: ASD, Cognition, rehabilitation, IQ.

المهارات المعرفية لدى الأطفال المصابين بأعراض صفات صورة اضطراب طيف التوحد

بعد تلقيهم ستة أشهر من إعادة التأهيل

الخلفية: يختلف السمات المعرفية في اعراض صفات صورة اضطراب طيف التوحد وما زالت حتى الآن موضوعا مثيرا للجدل. نظرا لأن القدرات المعرفية تساهم في شدة الطيف فمن الضروري محاولة فهم تأثير هذه القدرات بشكل أفضل على التشخيص العام في اعراض صفات صورة اضطراب طيف التوحد لذلك، سيتم استهداف من خلال تنفيذ برنامج إعادة التأهيل ثم تقييم القدرات المعرفية ومستوى خطورة في اعراض صفات صورة اضطراب طيف التوحد بعد تلقي ستة أشهر من التدخل.

الهدف: تهدف الدراسة إلى تحديد تحسن الملامح المعرفية باستخدام الـSB5 على الأطفال المصابين بالتوحد بعد تلقي التدخل/ إعادة التأهيل لمدة ستة أشهر.

المرضى والطرق: تم إجراء دراسة تدخلية مستقبلية على عينة من الأطفال المصريين الذين يعانون من اضطراب طيف التوحد والذين تتراوح أعمارهم بين (3- 7) سنوات يبحثون عن الدعم في مركز ذوي الاحتياجات الخاصة خلال الفترة من يناير 2021 إلى يناير 2022 تعرض الأطفال لما يلي قبل وبعد التدخل مقابلة نفسية سريرية شبه منظمة مرتين أولا Stanford Binet 5 بما في ذلك ADOS- 2 و DSM 5 وبرنامج إعادة التأهيل CCPSN.

النتائج: كان هناك اختلاف قوي فيما يتعلق بجميع الأطفال الخمسة والعشرين بعد برنامج إعادة التأهيل المعزز للإدراك بين اختبار الذكاء قبل وبعد 0.002 =pكان هناك اختلاف قوي قبل وبعد اختبار ADOS 0.001 ≥p لجميع الأطفال.

الاستنتاج: يعتبر استخدام تنفيذ برنامج التدخل لتحسين القدرات المعرفية لدى الأطفال المصابين بأعراض صفات صورة طريقة علاجية فعالة لتعزيز الكفاءة المعرفية. كانت هذه النتيجة المهمة أكثر وضوحا في الذكور منها في الإناث، وأظهرت الإناث فقط اختلافات كبيرة في المكون البصري المكاني لمعدل الذكاء.

الكلمات المفتاحية: اضطراب طيف التوحد، الملامح المعرفية، المعرفة، معدل الذكاء، إعادة التأهيل.