

Assessment of Motor Performance and Functional Academic Skills of Children With Autism Spectrum Disorder in the United Arab Emirates

Mahmoud Alakayleh^{[a],*}; Ibrahim El-Zraigat^[b]

^[a] Independent author, United Arab Emirates.

^[b] Counselling and special education, The university of Jordan, Amman, Jordan.

*Corresponding author.

Received 21 May 2023; accepted 15 August 2023

Published online 26 September 2023

Abstract

The current study aimed to assess the level of motor performance and functional academic skills of children with autism spectrum disorder in the United Arab Emirates. The sample included 103 cases of children with autism spectrum disorder (69 males and 34 females) enrolled in government and private special education centers in the United Arab Emirates. To achieve the aim of the study, the researcher constructed a scales of the motor performance and functional academic skills, and the validity and reliability of them were verified. In order to answer the questions of the study, the descriptive survey methodology was used, and the means, standard deviations, and one-way analysis of variance were used in data processing and reaching results. The results indicated low levels of motor performance and functional academic skills for children with autism spectrum disorder on the scales used by the study. The study recommended the necessity of including motor performance and functional academic skills in treatment programs.

Key words: Motor Performance; Functional Academic skills; Children with Autism Spectrum Disorder; The United Arab Emirates

Alakayleh, M., & El-Zraigat, I. (2023). Assessment of Motor Performance and Functional Academic Skills of Children With Autism Spectrum Disorder in the United Arab Emirates. *Higher Education of Social Science*, 25(1), 66-70. Available from: URL: <http://www.cscanada.net/index.php/hess/article/view/13119>
DOI: <http://dx.doi.org/10.3968/13119>

AN INTRODUCTION

Autism spectrum disorder (ASD) is a genetic neurodevelopmental disability characterized by persistent deficits in social interaction and communication, repetitive behaviors, and restricted activities and interests. The term “spectrum” of autism spectrum disorder refers to a wide range of symptoms and severity. Recently, the rapid increase in the prevalence of this disorder has been noted. The Centers for Disease Control and Prevention (CDC) indicated that the prevalence rate was estimated at 1 in 36 children will have an autism spectrum disorder (Centers for Disease Control and Prevention (CDC), 2023).

A child with autism spectrum disorder suffers from remarkable difficulties in social interaction and communication skills. However, the child does not respond appropriately to social situations, communication and interaction with others. This is of course a result of the disorder and the symptoms it presents. In addition, A child with autism spectrum disorder exhibits patterns of unusual, stereotypical, and ritualistic behavior. All these behaviors and symptoms call for early diagnosis, comprehensive assessment, and the need to develop comprehensive treatment programs aimed at providing them with the adaptive skills necessary for them to carry out daily life activities. (Mayo Clinic, 2022; American Psychiatric Association, 2022; El-Zraigat, 2016, 2020).

The comprehensive assessment includes collecting various data aimed at understanding the child and helping to identify strengths and weaknesses, making appropriate decisions in the field of education and rehabilitation, and identifying factors that help the child learn and develop his abilities and skills (Ideas That Work, 2022).

An appropriate comprehensive evaluation provides us with data on the most effective strategies in educating the child and how to implement them. Therefore, effective interventions are those that based on the results of a meaningful comprehensive evaluation. Hence, the evaluation also helps to determine the skills that

have improved and how the program or treatment is progressing, and therefore the evaluation identifies and detects changes in growth. Thus, assessment helps determine a child's learning and performance over time. This allows the data to continuously guide the process of setting goals and programs. Hence, education is effective when it depends on the child's learning style, realistic goals, and the teacher's skills (Ozonoff et al., 2005; Partington, 2006; Klin, Saulnier, Tsatsanis & Volkmar, 2014).

The assessment team describes functioning skills, in terms of what the child can do in non-academic areas of daily life, such as communication, interpersonal skills, social interaction, behaviour, regulation skills (BARRINGTON, 2023).

The study of Odeh, Gladfelter, Stoesser and Roth (2022) indicated that children with autism spectrum disorder have great difficulty in total motor performance, including difficulty in performing complex motor tasks and balance tasks compared to their neurotypical peers. While Kaur, Srinivasan, and Bhat (2018) indicated that children with autism spectrum disorder had lower motor scores on large and fine skills, regardless of their IQ scores. Dalton, Crais and Velleman (2017) confirmed in their study that children with autism spectrum disorder had poorer joint attention skills overall than children with SCAS.

Kurth and Mastergeorge (2010) described the academic and cognitive profiles of children with autism spectrum disorder, and indicated that there were statistically significant differences between the group in measures of academic achievement. The study of Berger and Ingersoll (2015) indicated that children with autism spectrum disorder suffer from weakness in their ability to recognize their imitation compared to their peers with normal development, and the results also showed that there is a link between the ability to imitate, and the severity of symptoms of autism spectrum disorder and language.

THE RATIONALE OF STUDY AND ITS QUESTIONS

The comprehensive assessment is seen as the most important step in the treatment program. A comprehensive evaluation includes collecting and analyzing comprehensive and diverse data with the aim of making the appropriate decision in terms of choosing the appropriate treatment or education and the method of education or rehabilitation. Thus, assessment is a necessary step in the overall planning of programs for children with autism spectrum disorder. However, children with autism spectrum disorder show difficulties and patterns of undesirable behavior that require special evaluation methods through the application of specialized measures appropriate to the nature of the disorder (Klin,

Saulnier, Tsatsanis & Volkmar, 2014). Hence, the current level of functioning includes the child's strengths, academic, social, emotional and physical needs. The current level of performance is based on the data and formative evaluation, and the statement defines all other components of the programme. In addition, the current level of performance helps in identifying the types of support and basic services that the child needs (NYC, 2022).

Thus, the importance of the current study in evaluating the motor performance and functional academic skills of children with autism spectrum disorder in the United Arab Emirates. Therefore, the present study sought to answer the following main question:

- Are there statistically significant differences at the level of significance ($\alpha = 0.05$) in the level of motor performance for children with autism spectrum disorder in the United Arab Emirates, according to the variable of the center in which the child is enrolled?
- Are there statistically significant differences at the level of significance ($\alpha = 0.05$) in the level of functional academic skills for children with autism spectrum disorder in the United Arab Emirates, according to the variable of the center in which the child is enrolled?

Purpose of the study

The current study aims to:

- Evaluate and describe the current level of performance of children with autism spectrum disorder in the United Arab Emirates in the field of motor performance and functional academic skills.

Participants

The sample included (103) cases of children with autism spectrum disorder who are enrolled in government and private special education centers in the United Arab Emirates. The collaborating centers included Al Ghaith Center for Training and Rehabilitation, Hemma Clinic, and Al Hanan Center for Rehabilitation of Children of Determination. The teachers of children with autism spectrum disorder in these centers evaluated the cases targeted for the study through the application of scales.

The Tools of study

Motor skill scale

This scale measures the dimensions of gross motor performance and fine motor performance. It has been constructed by referring to related literature such as: (American Psychiatric Association (APA), 2022; Brian, Zwaigenbaum, and Ip, 2019; Choi, Leech, Tager-Flusberg, et al. 2018; Liu, Hamilton, Davis, and ElGarhy, 2014; LIUL., KAARENGALA, and LITCHKE, 2019; Phytanza, Burhaein, and Pavlovic, 2021; The British Columbia Ministry of Health Planning, 2003; The Irish Society For Autism, 2014; El-Zraigat, 2013).

The scale consists of 32 items distributed on the following dimensions:

- Gross motor performance.
- Fine motor performance.

To extract the indications of the construct validity indicators in terms of the item's correlation with the dimension of the scale, the correlation coefficients for each item and the total score were extracted, and between each item, and its relevance to the domain to which it belongs, and between the domains with each other and the total score, and that was in a survey sample consisting of (30) participants, the correlation coefficients of the items with the tool as a whole ranged between (0.45-0.85), and was with the range (0.52-0.90).

To ensure the reliability of the scale, the test-retest method was verified by applying the scale, and re-applying it after two weeks on a group of (30) participants from outside the study sample, and then the Pearson correlation coefficient was calculated between their estimates in the two times and ranged between 0.82 - 0.86.

Functional Academic Skills Scale

This scale measures dimensions of reading skills, writing skills, and mathematics skills. It was constructed by referring to relevant literature such as: (American Psychiatric Association (APA), 2022; Beare, 2020; Brian, Zwaigenbaum, and Ip, 2019; LEARNING WITHOUT TEARS, 2020; The British Columbia Ministry of Health Planning, 2003; The Irish Society For Autism, 2014; Webster, 2020).

The scale consisted of 33 items distributed on the following dimensions:

- Reading skills.
- writing skills.
- Mathematics skills

In order to extract the indications of the construct validity, the correlation of the item with the dimension of the scale were achieve. The correlation coefficients of each item and the total score, and between each item and its connection to the domain to which it belongs, and between the domains with each other and the total score, were extracted in a survey sample consisting of (30) participants. The correlation coefficients of the items with the tool as a whole ranged between (0.46-0.89), and with the domain (0.61-0.96).

To ensure the reliability of the scale, it was verified by the test-retest method by applying the scale, and re-applying it after two weeks on a group of (30) participants who are from outside the study sample, and then the Pearson correlation coefficient was calculated between their estimates in the two times, and it ranged between 0.80-0.84.

Study methodology

In order to answer the study questions, the descriptive survey method was adopted in this study, and it included

the variables of the scales used in data collection, and the variable of the center to which the child is enrolled. means, standard deviations, and one-way analysis of variance were used in analyzing the data.

RESULTS

This part of the research presents the results organized according to the questions:

Results of the question: Are there statistically significant differences at the level of significance ($\alpha = 0.05$) in the level of motor performance for children with autism spectrum disorder in the United Arab Emirates, according to the variable of the center in which the child is enrolled?

To answer this question; The arithmetic means and standard deviations of the level of motor performance for children with autism spectrum disorder, in the United Arab Emirates, were extracted according to the variable of the center in which the child is enrolled. The table below explains this.

Table 1
The arithmetic means and standard deviations of the level of motor performance for children with autism spectrum disorder in the United Arab Emirates, according to the variable of the center in which the child is enrolled

Centers		Gross motor	Fine motor	Motor performance
Al Ghaith Center for Training and Rehabilitation	M	2.67	2.11	2.40
	S.D	0.800	0.884	0.782
Hemma Clinic	M	2.76	1.92	2.35
	S.D	0.611	0.301	0.38
Al Hanan Center for Rehabilitation	M	2.67	2.041	2.37
	S.D	0.68	0.623	0.575

Table 1. shows an apparent variation in the arithmetic means and standard deviations of the level of motor performance for children with autism spectrum disorder in the United Arab Emirates. Because of the different categories of the center variable to which the child is enrolled. In order to show the significance of the statistical differences between the arithmetic means, the one-way analysis of variance was used.

Table 2
One-way analysis of variance of the effect of the center the child attends on the level of motor performance for children with autism spectrum disorder in the United Arab Emirates

Source of variance	Sum of square	Freedom degree	M. of square	F	Sig.	Size effect
centers	0.017	2	0.008	0.024	0.98	0.000
error	36.616	100	0.366			
total	36.633	102				

It can be seen from Table 2. that there are no statistically significant differences ($\alpha = 0.05$), due to the

effect of the center in which the child is enrolled, as the p-value was 0.024, with a statistical significance of 0.98.

Results of the question: Are there statistically significant differences at the level of significance ($\alpha = 0.05$) in the level of functional academic skills for children with autism spectrum disorder in the United Arab Emirates, according to the variable of the center in which the child is enrolled?

In order to answer this question, the arithmetic means and standard deviations of the functional academic skills level of children with autism spectrum disorder in the United Arab Emirates were extracted according to the variable of the center in which the child is enrolled. The table below explains this.

Table 3
Arithmetic means and standard deviations for the level of functional academic skills for children with autism spectrum disorder in the United Arab Emirates, according to the variable of the center in which the child is enrolled

Centers		Reading skills	Writing skills	Math skills	Functional academic skills
Al Ghaith Center for Training and Rehabilitation	M	1.55	2.21	1.43	1.74
	S.D	0.911	1.200	0.710	0.788
Hemma Clinic	M	1.33	1.88	1.18	1.47
	S.D	0.606	0.986	0.299	0.475
Al Hanan Center for Rehabilitation	M	1.49	1.96	1.29	1.59
	S.D	0.763	1.039	0.475	0.578

Table 3. shows an apparent variation in the arithmetic means and standard deviations of the level of functional academic skills of children with autism spectrum disorder in the United Arab Emirates; Because of the different categories of the center variable to which the child is enrolled.

Table 4
One-way analysis of variance of the impact of the center the child attends on the functional academic skills of children with autism spectrum disorder in the United Arab Emirates

Source of variance	Sum of square	Freedom degree	M. of square	F	Sig.	Size effect
centers	0.739	2	0.368	0.969	0.384	0.019
error	38.148	100	0.382			
total	38.886	102				

It can be seen from Table 4. that there are no statistically significant differences ($\alpha = 0.05$), attributed to the effect of the center in which the child is enrolled, as the value of p was 0.969, and with a statistical significance of 0.384.

THE LIMITATIONS AND DELIMITATIONS OF THE STUDY

The limits were represented by the characteristics of the study sample, the time of its application, and the place in which it was conducted, represented in the United Arab Emirates. In addition, the content of the measures used in the study. It is also determined by the accuracy of the response to the scales used in the study.

DISCUSSION AND CONCLUSIONS

The results indicated that there is an apparent, non-statistically significant variation in the arithmetic means of the level of motor performance among children on the autism spectrum. The interpretation of this result is attributed to the fact that these children show a different motor pattern, due to the characteristics of the disorder that restrict communication and social interaction, and the lack of motor experiences that a child on the autism spectrum is preoccupied with. The evaluation measure targeted gross motor performance and fine motor performance. It has been shown that therapeutic interventions often focus on developing communication and social interaction, and reducing unwanted behaviors. Also, motor performance is sometimes not targeted for training.

The results indicated that there is an apparent, non-statistically significant variation in the arithmetic means of the level of functional academic skills for this type of child. Because of the different categories of the center variable to which the child is enrolled. The explanation is attributed to the fact that these children show clear weakness in the practice of functional academic skills. The scale reflected the evaluation of reading skills, writing skills, and mathematics skills, which are skills that are often not learned as much as the focus is on communication, social skills, and repetitive behaviors.

It is noteworthy that the results of this study are generalized within the framework of its limitations. Based on the results, the researchers recommend the following:

- The necessity of conducting a comprehensive assessment for children with autism spectrum disorder to include all skills that affect performance in their daily life.
- Include assessment of motor performance and functional academic skills in the comprehensive assessment of children with autism spectrum disorder.
- Targeting variables such as age, and how performance differs in skills accordingly.

REFERENCES

- American Psychiatric Association. (2022). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Washington, DC.

- BARRINGTON. (2023). *Present Levels of Academic Achievement and Functional Performance* (PLAAFP). BARRINGTON, RI Public Schools Measurable IEPs. <https://measurableieps.weebly.com/present-level-of-performance.html>
- Beare, K. (2020). *Study Skills for Beginners*. <https://thoughtco.com/study-skills-for-beginners-1210057>
- Berger, N. I., & Ingersoll, B. (2015). An Evaluation of Imitation Recognition Abilities in Typically Developing Children and Young Children with Autism Spectrum Disorder. *Autism Research*, 8(4), 442-453. <https://doi.org/10.1002/aur.1462>
- Brian, J., Zwaigenbaum, L., & Ip, A. (2019). Standards of Diagnostic Assessment for Autism Spectrum Disorder. Canadian Paediatric Society, Autism Spectrum Disorder Guidelines Task Force, Ottawa, Ontario. *Paediatrics and Child Health*, 444-451. <https://doi.org/10.1093/pch/pxz117>
- Centers for Disease Control and Prevention. (2023). *ASD Diagnosis, Treatment, and Services*. <https://www.cdc.gov>
- Choi, B., Leech, K. A., Tager-Flusberg, H., et al. (2018). Development of Fine Motor Performance Is Associated with Expressive Language Outcomes in Infants at High and Low Risk for Autism Spectrum Disorder. *Journal of Neurodevelopmental Disorders*, 10(14). <https://doi.org/10.1186/s11689-018-9231-3>
- Dalton, J. C., Crais, E. R., & Velleman, S. L. (2017). Joint Attention and Oromotor Abilities in Young Children with and without Autism Spectrum Disorder. *Journal of Communication Disorders*, 69, 27-43. <https://doi.org/10.1016/j.jcomdis.2017.06.002>
- El-Zraïgat, I. (2013). *Early Intervention: Models and Procedures*. Amman: Dar Al Masirah.
- El-Zraïgat, I. (2016). *Autism: Behavior, Diagnosis, and Treatment* (2nd ed.). Amman: Dar Wael.
- El-Zraïgat, I. (2016). *Severe and Multiple Disabilities*. Amman: Dar Al Masirah.
- El-Zraïgat, I. (2020). *Effective Interventions with Autism Spectrum Disorder*. Amman: Dar AlFiker.
- IDEAS THAT WORK. (2022). *Present Levels* (Component of the IEP). IDEAS THAT WORK. U.S. Department of Education, Office of Special Education Programs.
- Kaur, M., Srinivasan, S. N., & Bhat, A. (2018). Comparing Motor Performance, Praxis, Coordination, and Interpersonal Synchrony between Children with and without Autism Spectrum Disorder (ASD). *Research in Developmental Disabilities*, 72, 79-95. <https://doi.org/10.1016/j.ridd.2017.10.025>
- Klin, A., Saulnier, C., Tsatsanis, K., & Volkmar, F. R. (2014). Clinical Evaluation in Autism Spectrum Disorders: Psychological Assessment within a Transdisciplinary Framework. In F. R. Volkmar, R. Paul, A. Klin, & Cohen D. (Eds.), *Handbook of Autism and Pervasive Developmental Disorders* (3rd ed., Vol. II, pp. 863–881). Hoboken, NJ: John Wiley and Sons.
- Kurth, J., & Mastergeorge, A. (2010). Academic and Cognitive Profiles of Students with Autism: Implications for Classroom Practice and Placement. *International Journal of Special Education*, 25(2), 8-14.
- LEARNING WITHOUT TEARS. (2020). *How to Improve Handwriting for Autistic Students?* <https://www.lwtears.com/blog/autism-handwriting>
- Liu, T., Hamilton, M., Davis, L., & ElGarhy, S. (2014). Gross Motor Performance by Children with Autism Spectrum Disorder and Typically Developing Children on TGMD-2. *Journal of Child and Adolescent Behavior*, 2(123). <https://doi.org/10.4172/jcalb.1000123>
- Liul, Kaarengala, V., & Litchke. (2019). Motor Competence and Social Function in Children with Autism Spectrum Disorder. *Journal of Physical Education and Sport (JPES)*, 19(1), Art 76, pp.521-526. <https://doi.org/10.7752/jpes.2019.01076>
- Mayo Clinic. (2022). *Autism Spectrum Disorder*. Mayo Foundation for Medical Education and Research (MFMER).
- NYC. (2022). *Present Levels of Performance Quality Checklist*. Department of Education, Division of Specialized Instruction and Student Support, Corrine Rello-Anselmi, Deputy Chancellor. New York State Education Department (NYSED).
- Odeh, C., Gladfelter, A., Stoesser, C., & Roth, S. (2022). Comprehensive Motor Performance Assessment in Children with Autism Spectrum Disorder Yields Global Deficits. *International Journal of Developmental Disabilities*, 68(3), 290-300. <https://doi.org/10.1080/20473869.2020.1764241>
- Ozonoff, S., Goodlin-Jones, B. L., & Solomon, M. (2005). Evidence-Based Assessment of Autism Spectrum Disorders in Children and Adolescents. *Journal of Clinical Child and Adolescent Psychology*, 34, 523–540.
- Partington, J. W. (2006). *The Assessment of Basic Language and Learning Skills-Revised* (ABLLS–R). Pleasant Hill, CA: Behavior Analysts, Inc.
- Phytanza, D., Burhaein, E., & Pavlovic, R. (2021). Gross Motor Performance Levels in Children with Autism Spectrum Disorder during the COVID-19 Pandemic. *International Journal of Human Movement and Sports Sciences*, 9(4), 738-745. <http://www.hrpub.org> DOI: 10.13189/saj.2021.090418
- The British Columbia Ministry of Health Planning. (2003). *Standards and Guidelines for the Assessment and Diagnosis of Young Children with Autism Spectrum Disorder in British Columbia: An Evidence-Based Report*. Prepared for The British Columbia Ministry of Health Planning 2003.
- The Irish Society for Autism. (2014). *Mental Health and Behavioral Conditions Autism*. Quality Standard [QS51]. NICE (National Institute for Health and Care Excellence). The Irish Society for Autism.
- Webster, J. (2020). *Functional Math Skills That Support Independence*. <https://thoughtco.com/functional-math-skills-that-support-independence-3111105>