Effectiveness of Equine-Assisted Therapy in Reducing Aggressive Behavior in Children with Autism Spectrum Disorder

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Abstract: This study aims to examine the effectiveness of equine-assisted therapy in reducing aggressive behavior among children with Autism Spectrum Disorder (ASD). The sample consisted of 20 children diagnosed with ASD and enrolled in a specialized private school. participants were divided into two groups: an experimental group consisting of 10 children who participated in an organized equine-assisted therapy program conducted at a horse training farm in Bir Touta, Algiers, and a control group of 10 children who did not receive any therapeutic intervention.

To achieve the objectives of the study, a quasi-experimental design with experimental and control groups was adopted using a pre-test and post-test measurement approach. An aggressive behavior scale was administered before and after the implementation of the therapy program to assess changes in aggressive behavior levels among the participants.

The results indicated a significant reduction in aggressive behavior among children who participated in the equine-assisted therapy program compared to those in the control group. These findings suggest that equine-assisted therapy may represent an effective complementary intervention for reducing aggressive behaviors in children with Autism Spectrum Disorder.

Keywords: Autism Spectrum Disorder, Equine-Assisted Therapy, Aggressive Behavior, Hippotherapy, Behavioral Intervention.

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1- Introduction:

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by persistent deficits in social communication and social interaction, as well as restricted and repetitive patterns of behavior, interests, or activities. These characteristics typically emerge during early childhood and significantly affect the individual's ability to function in social, educational, and daily life contexts (American Psychiatric Association, 2013).

Behavioral difficulties are among the most Prevalent challenges faced by children with autism spectrum disorder. These difficulties include stereotyped behaviors, tantrums, hyperactivity, attention deficits, and resistance to instructions. Such behaviors are often associated with the child's difficulty in expressing their needs or communicating effectively with their surrounding environment.

Aggressive behavior, in particular, represents one of the most challenging problems encountered by parents, teachers, and therapists working with autistic children. Research indicates that behavioral disturbances such as aggression can negatively affect the child's social relationships and participation in educational environments, which highlights the importance of developing effective therapeutic interventions targeting these behaviors (Matson & Rivet, 2008).

Given the complexity and overlapping nature of these symptoms, there has been a growing need to explore comprehensive therapeutic approaches that integrate psychological, sensory, and motor dimensions. Among the most prominent of these approaches is equine-assisted therapy, also known as hippotherapy, which has demonstrated effectiveness in improving multiple developmental aspects in children with Autism Spectrum Disorder, particularly at the behavioral and social domain.

In recent years, equine-assisted therapy has gained increasing attention as a complementary intervention for children with Autism Spectrum Disorder. By engaging them in structured activities with horses under professional supervision, this approach supports improvements in emotional regulation, social interaction, and overall behavioral adjustment (Bass, Duchowny, & Llabre, 2009).

Equine-assisted therapy provides a distinctive therapeutic context in which children engage in activities such as grooming, leading, and riding horses. These activities promote sensory stimulation, emotional bonding, and enhanced self-confidence, all of which may contribute to Improved behavioral regulation and greater emotional control among children with Autism Spectrum Disorder (Gabriels et al., 2015).

Several empirical studies have reported positive outcomes associated with equine-assisted interventions for children with ASD. For instance, Ghadimi Kalateh et al. (2023) conducted an eight-week horse therapy program involving 24 adolescents, divided into an experimental and a control group. Using the Children's Scale of Hostility and Aggression – Reactive/Proactive (C-SHARP), researchers found a significant reduction in aggressive behaviors in the experimental group compared to the control group, suggesting that Enquine -assisted group constitutes an effective intervention for managing aggression in adolescents with ASD.

Similarly, Anderson and Meints (2016) evaluated the effects of a five-week therapeutic riding program on the social functioning of 15 children and adolescents with ASD. The intervention improved empathizing abilities and reduced maladaptive behaviors. Although not all aspects of adaptive behavior, such as socialization and communication, were significantly affected, the study demonstrated that equine-assisted activities can enhance specific aspects of social functioning and mitigate certain ASD-related behavioral difficulties.

Lanning et al. (2014) Further reported that participation in equine-assisted activities improved emotional functioning and behavioral regulation among children with autism.

This level, Systematic reviews have highlighted the potential benefits of equine-assisted therapy in enhancing social interaction, communication skills, and behavioral adaptation in individuals with ASD (Srinivasan, Cavagnino, & Bhat, 2018).

Furthermore, additional reviews suggest that equine-assisted interventions may contribute to reducing problematic behaviors and promoting social engagement in children with autism, making them a promising complementary intervention within multidisciplinary treatment programs (Peters & Wood, 2017).

Despite the growing body of evidence supporting equine-assisted interventions, research examining their specific impact on aggressive behavior among children with ASD remains limited. Accordingly, the present study seeks to address the following research question:

To what extent is equine-assisted therapy effective in reducing aggressive behavior among children with Autism Spectrum Disorder?

2- Objectives of the Study:

- To identify the therapeutic characteristics of equine-assisted therapy and provide information about this intervention.
- To examine the effectiveness of equine-assisted therapy in reducing aggressive behavior toward both self and others among children with Autism Spectrum Disorder.

3- Significance of the Study:

- Improving the daily quality of life of individuals with ASD
- Promoting the use of equine-assisted therapy as a primary therapeutic approach for children with autism.
- Supporting behavioral and emotional regulation in children with ASD
- Contributing to the development of non-pharmacological therapeutic interventions for autism

4- Research Hypotheses

1. First Hypothesis:

There are no differences in aggressive behavior between the control group and the experimental group in the pre-test measurement among children with ASD

Second Hypothesis:

There are statistically significant differences in aggressive behavior between the control group and the experimental group in the post-test measurement in favor of the experimental group among children with ASD.

5-Equine-Assisted Therapy and Autism Spectrum Disorder:

Equine-assisted therapy represents one of the integrative therapeutic approaches grounded in psychological, behavioral, and social principles in working with children with Autism Spectrum Disorder. In this regard, Densmore (2007) emphasizes that children with autism, particularly those with higher levels of functioning, tend to prefer adult attention and natural, open environments, which makes equine-assisted settings especially conducive to fostering social interaction and emotional expression. Within such environments, the horse acts as a responsive and sensitive therapeutic partner capable of reacting to human cues, thereby creating a structured and emotionally safe context that facilitates engagement and supports self-regulation. This therapeutic context allows children to interact in a more spontaneous and less restrictive manner compared to traditional clinical settings, which may contribute to reducing aggressive behaviors and enhancing communication skills. In the same perspective, Hameury (2018) highlights that interaction with the horse provides rich sensory and relational experiences, where the horse functions as a therapeutic mediator within a triadic relationship (child–therapist–horse), contributing to the development of body awareness and the construction of self-boundaries, while also supporting emotional regulation through direct and meaningful engagement. Empirical evidence supports this perspective, as therapeutic horseback riding has been shown to significantly improve socialization, communication, and self-regulation among children with Autism Spectrum Disorder (Gabriels et al., 2012). Furthermore, structured activities involving the horse, such as grooming, feeding, and guided riding, promote the development of joint attention, sensory integration, and behavioral regulation, which are essential skills often impaired in children with autism (Anderson & Meints, 2016).

Additionaly, participation in equine-assisted programs has been associated with improvements in social functioning, attention, and sensory processing, which are closely linked to a reduction in disruptive and aggressive behaviors (Bass et al., 2009).

At the physiological domain, equine-assisted therapy has been found to induce positive hormonal changes, including a reduction in cortisol levels related to stress and an increase in oxytocin-related responses associated with trust and social bonding, thereby contributing to emotional stability and decreasing aggressive tendencies (Tabares et al., 2012). Accordingly, the integration of

sensory stimulation, emotional support, and social interaction within equine-assisted therapy creates a comprehensive therapeutic environment that supports behavioral adjustment and contributes to the reduction of aggressive behavior in children with Autism Spectrum Disorder.

6-Method and Tools:

6-1 Research Design:

A quasi-experimental design was employed, incorporating both an experimental group and a control group, using pre-test and post-test measures.

6-2 Participants:

The present study included 20 children diagnosed with Autism Spectrum Disorder who were enrolled in a specialized private school for children with ASD. The participants were divided into two groups: the experimental group (n = 10), which received the equine-assisted therapy program, and the control group (n = 10), which did not receive any therapeutic intervention.

6-3 Research Instrument:

Aggressive behaviors were assessed using the Aggressive Behavior Scale (ABS) (2024) developed by Shaimaa Mohamed Ali Hilal. The scale was administered to all participants both before and after the therapeutic intervention to measure changes in aggressive behavior levels.

To ensure the appropriateness of the instrument for the study sample, its psychometric properties were examined on a local sample prior to its application.

- **Psychometric Properties of the Aggressive Behavior Scale:**

In the present study, the researcher relied on the Aggressive Behavior Scale in order to collect the necessary data for the fieldwork and to test the formulated hypotheses. Prior to its use, it was essential to verify its validity and reliability. Therefore, the psychometric properties of the scale were examined, including validity and reliability.

The scale was administered to a sample of (100) children. Reliability was assessed using the internal consistency method through Cronbach's Alpha coefficient, while validity was examined using discriminant validity. The results are presented as follows:

Reliability of the Aggressive Behavior Scale:

After administering the scale to a sample of (100) children, its reliability was estimated using the internal consistency method through Cronbach's Alpha formula. The following table presents the results:

Table (5): Cronbach's Alpha Value for the Aggressive Behavior Scale

Scale	Sample	Raw Alpha Value	Standardized Alpha Value
Aggressive Behavior	100	0.723	0.715

As shown in Table (5), the reliability coefficients estimated using Cronbach's Alpha for the Aggressive Behavior Scale reached (0.72) for the raw scores, while the standardized Cronbach's Alpha coefficient for the overall scale was (0.71). These values indicate that the scale demonstrates an acceptable level of reliability, which supports its use for research purposes.

- **Validity of the Aggressive Behavior Scale:**

After administering the Aggressive Behavior Scale to a sample of (100) children, its validity was examined. Discriminant validity was assessed by comparing the scores of the upper and lower groups using the independent samples t-test. The following tables present the results:

Table (6): Mean and Standard Deviation for Upper and Lower Groups

Variable	Groups	Sample Size	Mean	Std. Deviation
Aggressive Behavior	Upper Group	27	15.38	1.627
	Lower Group	27	09.52	4.72

As presented in Table (6), the mean score of the upper group (individuals with high aggressive behavior) was (15.38), which is higher than the mean score of the lower group (individuals with low aggressive behavior), estimated at (09.52).

Table (7): Results of the t-test

Variable	Degrees of Freedom	T-value	Significance Level
Aggressive Behavior	52	13.614	Significant at 0.01

Table (7) shows that the calculated t-value reached (13.61), which is statistically significant at the (0.01) level. This indicates that the observed differences between the group means are statistically significant, confirming that the Aggressive Behavior Scale has a strong ability to discriminate between individuals based on their levels of aggressive behavior.

- **Conclusion on Psychometric Properties:**

Based on the obtained results regarding both reliability and validity, it can be concluded that the Aggressive Behavior Scale demonstrates an acceptable level of reliability and validity. Therefore, it can be considered an appropriate and dependable instrument for data collection in the fieldwork of the present study.

7-Intervention Program:

The equine-assisted therapy is based on an integrative therapeutic approach that aims to provide a comprehensive intervention for children with Autism Spectrum

Disorder by combining several psychological and behavioral approaches, including:

- Cognitive Behavioral Therapy (CBT): using positive reinforcement, therapeutic play, and behavior modification techniques.
- Social Learning Theory: learning through observation, imitation, and modeling.
- Gestalt Therapy: focusing on awareness of the present moment and emotional expression.
- Play Therapy: used as an indirect way of communication, expression, and behavior understanding.
- Person-Centered Therapy: providing a safe environment that encourages respect and free self-expression.

This combination aims to improve the effectiveness of equine-assisted therapy by creating a holistic therapeutic environment that considers the psychological, behavioral, sensory, and social aspects of the child.
Based on this framework, the program is divided into two main phases: The preparatory phase The therapeutic phase

1. **Preparatory Phase: Initial Contact with the Horse:**

Duration: This phase is implemented during the first sessions of the program (sessions 1–3), depending on the child's level of acceptance and responsiveness to the therapeutic environment.

Objectives:

- To psychologically and sensorily prepare the child for interaction with the horse and the stable environment.
- To reduce anxiety and tension resulting from new and unfamiliar situations.
- To enhance the sense of safety and emotional stability through the presence of a familiar person.
- To achieve gradual adaptation to the therapeutic environment without pressure.
- To build an initial positive relationship between the child and the horse.
- To develop sensory exploration and non-verbal interaction.

Tools: Therapy horse Stable environment Grooming and cleaning tools Riding equipment (for familiarization only: saddle, bridle, helmet) Therapist and accompanying caregiver

2. **Therapeutic Phase: Building the Relationship and Interaction with the Horse**

Duration: This phase begins after the child's adaptation to the therapeutic environment and continues throughout the remaining sessions of the program (sessions 4–12).

Objectives:

- To develop non-verbal and visual communication skills.
- To enhance attention and concentration.

- To improve balance and motor coordination.
- To support emotional regulation and behavioral control.
- To reduce aggressive and emotional behaviors.
- To enhance self-confidence and the sense of achievement.

Tools: Therapy horse Saddle, bridle, and helmet Ground and riding activity materials Stable environment Educational support tools (balls, simple command training materials) Specialized therapist.

Table: Therapeutic Activities within the Equine-Assisted Intervention Program

Stage	Therapeutic Activities	Objectives	Duration	Number of Sessions
Before Riding	Grooming the horse, preparing equipment, introducing and naming tools (saddle, bridle, helmet), teaching simple commands (stop, go), and explaining riding procedures.	Prepare the child for interaction, enhance attention and observational learning, develop non-verbal communication, and reduce anxiety related to the new activity	10–15 minutes per session	Throughout all intervention sessions
During Riding	Balance exercises (front, side, and back sitting positions), arm movements, passing objects (e.g., ball), and following instructions while riding	Improve balance and motor coordination, enhance attention and concentration, develop sensory-motor integration, and strengthen response to instructions.	20–30 minutes per session	6–8 therapeutic sessions
After Riding	Petting and rewarding the horse, identifying body parts of the horse, walking beside the horse, and returning equipment.	Reinforce social interaction, support positive reinforcement learning, reduce post-activity tension, and enhance responsibility and independence.	10–15 minutes per session	All sessions

8-Data Analysis:

Pre-test and post-test scores were analyzed to determine differences between the experimental and control groups. Statistical analyses were performed using descriptive statistics and t-tests to evaluate the effectiveness of the therapeutic program.

9-Analysis and Testing of Hypotheses:

9-1 First Hypothesis:

Hypothesis statement:
"There are no differences in aggressive behavior between the control group and the experimental group in the pre-test measurement among children with Autism Spectrum Disorder."
To verify this hypothesis, an independent samples t-test was used.
Table (1): Descriptive Statistics for the First Hypothesis

Variable	Pre-test	Sample	Mean	Std. Deviation
Aggressive behavior	Experimental group	10	18.40	13.59
	Control group	10	16.70	8.907

The results in Table (1) show that the mean score of aggressive behavior among children with ASD in the experimental group during the pre-test was **18.40**, with a standard deviation of **13.59**. This is approximately equal to the mean score of the control group in the pre-test, which was **16.70**, with a standard deviation of **8.907**. This indicates that the slight differences observed in the arithmetic means reflect the similarity between the control and experimental groups in terms of the level of aggressive behavior.

Table (2): Results of the First

Variable	Df	T-value	Significance Level
Aggressive behavior	18	0.33	Not Statistically Significan

Table (2) indicates that the calculated t-value was 0.33, which is not statistically significant. This means that there is no statistically significant difference between the control and experimental groups in the pre-test measurement. Therefore, it can be concluded that children with ASD in both groups had the same level of aggressive behavior before the intervention. Accordingly, the first hypothesis was accepted

9-2 Second Hypothesis

Hypothesis statement:
There are statistically significant differences in aggressive behavior between the control group and the experimental group in the post-test measurement in favor of the control group among children with Autism Spectrum Disorder.
To verify this hypothesis, an independent samples t-test was used. The following table presents the results.

Table (3): Descriptive Statistics for the Second Hypothesis

Variable	Post-test	Sample	Mean	Std. Deviation
Aggressive behavior	Experimental group	10	5.30	4.738
	Control group	10	10.70	4.620

The results in Table (3) indicate that the mean score of aggressive behavior among children with ASD in the experimental group during the post-test was 5.30, with a standard deviation of 4.73, whereas the mean score of the control group was 10.70, with a standard deviation of 4.62. These differences in means suggest the positive role of the therapeutic program in reducing aggressive behavior among children with autism in the experimental group.

Table (4): Results of the Second Hypothesis

Variable	Df	T-value	Significance Level
Aggressive behavior	18	2.58	Significant at 0.05

Table (4) shows that the calculated t-value was 2.58, which is statistically significant at the 0.05 level. This indicates a statistically significant difference between the scores of children with ASD in the control and experimental groups in the post-test measurement of aggressive behavior, in favor of the experimental group. Accordingly, the second hypothesis was accepted.

9-3 Answer to the Main Research Question:

Based on the results of the first hypothesis, which indicated that there were no differences in aggressive behavior between the control group and the experimental group in the pre-test measurement among children with Autism Spectrum Disorder, and which was accepted, as well as the results of the second hypothesis, which indicated the existence of statistically significant differences in aggressive behavior between the control group and the experimental group in the post-test measurement in favor of the control group, and which was also accepted, this means that aggressive behavior among children with autism was indeed affected by the therapeutic program applied to the experimental sample.

Accordingly, it can be concluded that the therapeutic program used was highly effective in reducing the level of aggressive behavior among children with ADS. On this basis, the hypothesis stating that equine-assisted therapy based on horseback riding is effective in reducing aggressive behavior among children with ADS was accepted.

10- Discussion and Interpretation of Results:

The results of the present study revealed statistically significant differences between the experimental group and the control group in the post-test measurement of aggressive behavior, with the experimental group showing a clear reduction in aggressive behavior scores compared to the control group following up the implementation of the equine-assisted therapy program. This finding indicates the effectiveness of the therapeutic program in reducing aggressive behavior levels among children with Autism Spectrum Disorder.

This result can be explained by the therapeutic characteristics of equine-assisted therapy, as it represents a comprehensive intervention that integrates psychological, sensory, motor, and social dimensions. Horseback riding is not merely a physical activity; rather, it constitutes an integrated therapeutic setting that provides the child with an opportunity to interact with a new and different environment
from the traditional classroom or therapeutic context. This, in turn, contributes to reducing stress, anxiety, and negative emotional states that may manifest in the form of aggressive behavior.

Moreover, direct interaction with the horse, whether through riding, touching, or grooming, helps the child establish a safe emotional bond, which positively affects their emotional state. Horses are considered a distinctive therapeutic medium because they provide a sense of safety and reassurance, allowing the child to express emotions in a nonverbal manner, a particularly significant feature given that children with ADS often experience difficulties in verbally expressing their needs and feelings.

On the other hand, the reduction in aggressive behavior may also be explained by the role of equine-assisted therapy sessions in improving emotional regulation and impulse control. During the sessions, the child is required to follow specific instructions, respect the sequence of activities, and regulate their movements while riding. This gradually contributes to the development of self-control skills and the ability to respond adaptively to different situations instead of resorting to aggressive behavior.

In addition, the sensory-motor aspect of equine-assisted therapy plays an important role in achieving this improvement. The rhythmic and repetitive movement of the horse helps calm the nervous system and regulate the child's sensory input, which is reflected in reduced internal tension and fewer aggressive behavioral responses. This aspect is particularly important for children with autism, given the sensory processing difficulties they often experience.

The findings may also be interpreted in light of the positive impact of equine-assisted therapy on self-confidence and the sense of competence. When the child is able to control the horse or successfully complete the tasks required during the session, this generates a sense of achievement and success, which helps reduce feelings of frustration and helplessness that may otherwise contribute to the emergence of aggressive behavior.

These findings are consistent with several previous studies that confirmed the effectiveness of equine-assisted therapy in improving behavioral and emotional aspects among children and adolescents with Autism Spectrum Disorder, such as the study by Ghadimi Kalateh et al. (2023), which reported a clear reduction in aggressive behaviors after an eight-week therapeutic program, as well as the study by Anderson and Meints (2016), which highlighted improvements in maladaptive behaviors and certain aspects of social functioning following a therapeutic riding program.

Accordingly, it can be concluded that equine-assisted therapy represents an effective complementary therapeutic approach for reducing aggressive behavior among children with ADS,as it provides comprehensive support that addresses the psychological, behavioral, sensory, and social dimensions of the child.

11- Conclusion:

In light of the findings of the present study obtained, equine-assisted therapy was found to contribute significantly to reducing aggressive behavior among children with Autism Spectrum Disorder, as the experimental group showed a noticeable decrease in aggressive behavior scores compared to the control group after the implementation of the therapeutic program. This result confirms the effectiveness of this type of therapeutic intervention in improving the behavioral and emotional aspects of this population.

These findings indicate that equine-assisted therapy is considered one of the supportive therapeutic approaches with a positive impact, as it provides a therapeutic environment that combines sensory stimulation, motor activity, and psychological support, which helps the child regulate emotions and reduce aggressive behaviors.

Based on these results, the study concludes that horseback riding–based therapy represents an effective intervention that can be incorporated into therapeutic programs designed for children with ADS , particularly in reducing behavioral disturbances and improving psychological and social adjustment.

Appendix of Tables and Figures:
Appendix of the First Hypothesis

Statistiques de groupe					
	N	N	Moyenne	Ecart type	Moyenne erreur standard
Pre-test	Experimental group	10	18,4000	13,59902	4,30039
	Control group	10	16,7000	8,90755	2,81681

Test des échantillons indépendants										
		Test de variances		Test t pour égalité des moyennes						
									Intervalle de confiance de la	
		F	Sig.	T	ddl	Sig. (bilatéral	Différenc moyenn	Différence erreur standard	Inférieur	Supérieur
Pre-test	Égales	9,694	,006	,331	18	,745	1,70000	5,14080	-9,10041	12,50041
	Inégales			,331	15,52	,745	1,70000	5,14080	-9,22533	12,62533

Appendix of the Second Hypothesis

Statistiques de groupe					
	N	N	Moyenne	Ecart type	Moyenne erreur standard
Post-test	Experimental group	10	5,3000	4,73873	1,49852
	Control group	10	10,7000	4,62000	1,46097

Test des échantillons indépendants										
		Test de Levene		Test t pour égalité des moyennes						
									Intervalle de confiance de la	
		F	Sig.	t	ddl	Sig. (bilatéral)	Différenc moyenne	Différence standard	Inférieur	Supérieur
Post-test	Égales	,120	,733	2,580	18	,019	-5,40000	2,09284	-9,79690	-1,00310
	inégales			2,580	17,98	,019	-5,40000	2,09284	-9,79711	-1,00289

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