

The effectiveness of involving parents in the Lovaas program in reducing the level of autism in their children (A case study)

فعالية اشراك الوالدين في برنامج لوفاس في خفض من درجة التوحد لدى أطفالهم
(دراسة حالة)

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Abstract

This study aimed to determine the effectiveness of involving parents in the Lovaas program in reducing the degree of autism in their children. The following question was posed: What is the extent of the effectiveness of involving parents in the Lovaas program in reducing the degree of autism in their children? The case study methodology was utilized for a child with Autism Spectrum Disorder (ASD), and the parents were trained on the Lovaas program. The quasi-experimental method was also used to measure the effectiveness of parental involvement in the Lovaas program in reducing the degree of autism. The following tools were employed: The Modified Childhood Autism Rating Scale CARS-2-ST. The Revised Assessment of Basic Language and Learning Skills ABLLS-R. It was concluded that involving parents in the Lovaas program is effective in reducing the degree of autism in their children.

Keywords: Autism, Lovaas Program, Childhood Autism Rating Scale.

المخلص

تهدف هذه الدراسة الى التعرف على مدى فعالية اشراك الوالدين في برنامج لوفاس في التقليل من درجة التوحد لدى أطفالهم، حيث تم طرح التساؤل التالي: ما مدى فعالية اشراك الوالدين في برنامج لوفاس في التقليل من درجة التوحد لدى أطفالهم؟ حيث تم استخدام منهج دراسة الحالة لطفل مصاب باضطراب طيف التوحد، ثم قمنا بتدريب الوالدين على برنامج لوفاس. كما تم استخدام المنهج الشبه تجريبي لقياس فعالية اشراك الوالدين في برنامج لوفاس في خفض من درجة التوحد، وقد تم استخدامنا: مقياس تقدير التوحد الطفولي المعدل، سلم تقييم المهارات الاساسية للتعلم واللغة المعدل، حيث تم التوصل الى ان اشراك الوالدين في برنامج لوفاس فعال في خفض من درجة التوحد لدى أطفالهم.

الكلمات الدالة: التوحد، برنامج لوفاس، مقياس تقدير التوحد الطفولي.

Introduction

Caring for and focusing attention on individuals with special needs and their families is a necessary process for the integration, solidarity, and cohesion of society. The family holds a special place in human societies due to its longevity, stability, and the impact it leaves, as parents carry out multiple duties that serve the interests of their children.

The issue of caring for children with autism is considered one of the contemporary topics that has preoccupied public opinion and specialists alike, given the annual increase in the percentage of affected individuals. This rate has reached \$1/161\$ children, according to the World Health Organization (WHO), in addition to the inability to control the causative factors of this disorder. However, the genetic factor is considered to have a significant impact, according to the Research Unit on Human Genes and Cognitive Functions affiliated with the Institut Pasteur (2003).

A child with an Autism Spectrum Disorder (ASD) lives within a family system where parents play an essential role in their life, concerning their upbringing and the acquisition of various values and skills to achieve independence in their daily life. This is due to the specific characteristics of the child with autism and the developmental disorder, various behavioral problems, and difficulties in learning and skill acquisition they experience.

This was confirmed by Rouhi Abdat (2012) in her study on children with autism and the role of the family in the training program. The family has a fundamental role in applying educational and therapeutic programs for the autistic child, as the family spends the most time with the child. They also monitor and observe for any problem or developments in the child's behavior and help specialists understand the child's strengths or weaknesses that do not usually appear in observation and examination settings. Furthermore, many parents have reached the stage of innovation in working with their children and resolving their behavioral problems.

The most important qualities and matters that the parents of a child with autism should possess are the following:

- Not feeling guilty about the presence of this child in the family.
- Involving the child in family events and informing the community about their disability.
- Joining family support groups and benefiting from the experiences of others (عبدات, 2012).

The results of the Ninth Arab Conference on the Care and Rehabilitation of People with Special Needs concluded the necessity of activating the role of parents in behavioral and educational programs for children with autism. It was determined that there is a noticeable increase and a positive trend towards activating the family's role and parental participation in programs for children with special needs, including the parental participation for children with autism in the various stages of preparing the child's Individualized Program. Historically, parents were viewed as recipients of instructions and guidance, but this viewpoint has changed to be replaced by active parental participation in the training program (محمود, 2016).

1. The Study Problem:

The Autism Society of America views autism as a type of developmental disorder that emerges in the first three years of a child's life. It is the result of neurological disturbances that affect brain functions and consequently impact various aspects of development, making social connection difficult for these children and causing them difficulty in communication, whether verbal or non-verbal. These children always respond to objects more than they respond to people. They become distressed by any change that occurs in their environment and constantly repeat physical movements or segments of words in an automatic, repetitive manner. The most important goal is to search for ways that work to raise the level of these children (المغوث, 2016).

Estimates derived from recent reviews by the World Health Organization (WHO) indicate that one in every 161 children is affected by Autism Spectrum Disorder (ASD). These estimates represent the average number of cases, and prevalence rates vary significantly by study, although some recent studies report much higher rates. Furthermore, the level of performance among individuals with ASD is highly variable, ranging from severe deficits to overwhelming skill in cognitive abilities. Statistics indicate that approximately 50% of individuals with the disorder also suffer from intellectual disabilities (OMS, 2013).

Regarding the causes of autism, they are numerous. Results from a study conducted by the Special Education Department at New York University in the United States classified the percentages of autism causes as follows: Neurological causes 21.71%, Psychological causes 22.66%, Genetic causes 19.76%, Environmental causes 7.27%, Sensitivity causes 6.70%, and Biological causes 6.66% (ميدون, 2016).

These causes lead to a defect in information processing by the senses in the child with ASD, which in turn leads to a defect in interacting with the surrounding environment. This affects the social, cognitive, linguistic, motor, and emotional aspects and extends to the development of behavioral problems. Despite all the disability and problems resulting from ASD, there is a significant improvement among affected individuals compared to other disorders if they receive good care and effective therapeutic programs that involve all stakeholders, including the school and the family.

The family plays an active role in therapeutic programs in the field of autism. They have a fundamental role in applying educational and therapeutic programs for the autistic child, as they spend the most time with the child. They monitor and observe for any problems or developments in the child's behavior and help specialists understand the child's strengths or weaknesses that do not usually appear in observation and examination settings. Furthermore, many parents have reached the stage of innovation in working with their children and resolving their behavioral problems.

The attendance of mothers at training and guidance sessions also has a positive effect, as it aims to address the problems faced by the family by providing disease prevention services, health and nutritional education programs, and care for individuals with special needs (عبد الرزاق, 2017).

Involving parents yields immense benefits for children with special needs, as well as for the parents and the school. Al-Huddiyan's study (2016) found that teaching parents the principles

and methods of modifying the behavior of their children with special needs, such as autism, helps them bring about significant changes in their child's behavior (الهديان, 2016).

There are several educational therapeutic programs designed to care for children with ASD, such as the TEACCH program, the RISE SON program, and the LOVAAS program, also known as the ABA program (Applied Behavior Analysis). ABA is a behavioral program that has yielded positive results in the care of children with autism, in addition to its ease of application by parents, educators, and psychologists.

Behavioral intervention has shown effectiveness in treating ASD in children, adolescents, and adults suffering from various behavioral problems. In 1972, Lovaas and his colleagues published a comprehensive study demonstrating the effectiveness of Applied Behavior Analysis in treating various behaviors (John & Ron, 2006).

The Applied Behavior Analysis program (or the Lovaas program) is defined by Cooper et al. as a science that uses techniques based on scientific principles to modify behavior by building socially acceptable evidences and modifying those considered problematic (Maurice, 2006).

The Applied Behavior Analysis program is characterized by several important points:

1. Focuses on Behavior: For excessive repetitive behaviors, it works to reduce intensity, duration, and frequency. For deficit behaviors (e.g., language or social deficits), it works to escalate intensity, duration, and frequency.
2. Based on Behavioral Theory: It is based on the fundamental principles of behavioral theory inspired by Skinner's experimental analysis of behavior.
3. Focuses on the Environment: It evaluates and modifies the functional environmental variables associated with the behavior.
4. Defines and Describes Procedures: It specifies the procedures used to modify behavior, which allows the procedures to be correct throughout the time.

A study by Legros Claire (2008) also demonstrated the effectiveness of involving parents in the Applied Behavior Analysis program by applying the program to a sample of ten (10) children. The results showed differences in the pre- and post-measurements on the Childhood Autism Rating Scale (CARS), indicating its effectiveness in modifying the behavior of children with autism (Legros, 2008).

Based on the foregoing: What is the effectiveness of involving parents in the Lovaas program in reducing the degree of autism in their children?

Hypothesis

Involving parents in the Lovaas program is effective in reducing the degree of autism in their children.

2. Objectives of the Study

- To identify the extent to which parent involvement and training in the Applied Behavior Analysis (ABA) program helps alleviate the degree of autism in their children.
- To confirm the importance of involving parents in therapeutic programs for developing the skills of the autistic child.

3. Importance of the Study

- Focusing attention on one of the most difficult developmental disorders in terms of care.

- Assisting parents in learning about effective therapeutic programs for caring for their children.
- Highlighting the importance of family involvement in the therapeutic program specific to their child.

4. Definition of Terms

Definition of Autism Spectrum Disorder (ASD):

Conceptual Definition:

The American Psychiatric Association defines it as a group of disorders characterized by qualitative impairments in reciprocal social interactions, communication patterns, and a restricted, stereotyped, and repetitive repertoire of interests and activities, representing a common feature in the individual's performance across all situations (Al-Qamish, 2011).

Operational Definition:

It is a developmental disorder that causes a deficit in the development of social relationships, verbal and non-verbal communication, imaginative and creative play, in addition to the appearance of various behavioral disturbances and the failure to acquire and develop many skills, which negatively affects all aspects of the child's life and development. It appears before the age of three.

Lovaas Program:

Conceptual Definition:

It is a program designed by the psychologist Ivar Lovaas in the United States of America. He built this method on the basis of Applied Behavior Analysis (behavior modification) through the theory of Operant Conditioning developed by "Skinner" in modern psychology, which posits that human behavior is learned by controlling antecedent stimuli and reinforcing consequences, and the theory emphasizes the possibility of learning new behavior through shaping (خلدومي, 2012).

Operational Definition:

It is a set of interrelated and organized procedures, structured according to a specific plan and using specific strategies, in order to achieve clear, defined goals. It involves the modification of the behavior of the child with Autism Spectrum Disorder. The researcher constructed it in the form of sessions over a specific time period to help parents reduce the degree of autism in their children.

5. Study Limits

Temporal Limits: The study started in July 2020 and continued until March 2021.

Spatial Limits: The study was conducted at the psychological, educational, speech therapy, and family care space for children with autism, affiliated with the Gaza Group of the Algerian Muslim Scouts, located on the second floor of the Al-Abbadiya Municipal Library, Ain Defla Province, Algeria.

Human Limits: The study sample consisted of a single family, chosen according to the following conditions:

- The child should not suffer from a co-occurring disorder alongside ASD, verified through the medical file.
- The parents should not be following any other therapeutic program.
- Motivation and agreement to implement the program and sign the authorization.

6. Study Tools:

The current study relied on the following tools:

The Clinical Interview:

A semi-structured interview was used, which relies on an interview guide planned in advance with some detail. It specifies the questions and their formulation, and the order and manner of their delivery, ensuring flexibility that keeps the approach natural.

For this purpose, we chose the case study method, with the aim of collecting, classifying, analyzing, and interpreting information about the client, inferring the problem, predicting the client's future condition, and providing recommendations for appropriate guidance methods.

Case Study Form for the Child with Autism Spectrum Disorder:

This study relied on a case study form for the autistic child prepared by the researcher. It contains most of the information related to Autism Spectrum Disorder, including: General information - Personal history - Medical history - Social connections - Schooling - Family health history - Siblings - Family relations - Assessment.

The Modified Childhood Autism Rating Scale (CARS-2-ST):

This scale was designed to identify autistic children and determine the severity of autism (mild, moderate, or severe). The second edition of the scale was developed to classify the diagnosis of high-functioning autistic individuals and to differentiate between autistic children and children with other developmental disabilities, especially educable intellectual disability. It is a behavioral scale consisting of 15 items, where the examiner assesses the subject based on observation, and the raw score is recorded to be converted into a standard score.

Step Two: Validity and Reliability

Although the Childhood Autism Rating Scale used in this study has been previously utilized and its structure and psychometric properties confirmed in several studies in Arab countries, its suitability must still be verified by calculating:

- **Reliability:** To verify the reliability of the Childhood Autism Rating Scale, the test-retest method was used, yielding a reliability coefficient value of 1.77, which is acceptable.
- **Factorial Validity (Construct Validity):** The researcher sought to confirm the conditions for factor analysis before using it by examining the correlation matrix and the Kaiser-Meyer-Olkin KMO measure of sampling adequacy, which indicates whether the sample is suitable for factor analysis. The following results were obtained:
 - There is variance among the correlation coefficients.
 - The KMO value is equal to 1.66, which is acceptable.

After confirming that the conditions for using factor analysis to determine the construct validity of the scale were met, we performed a Confirmatory Factor Analysis of the scale items using the principal components method, based on the extracted indicators using the SPSS program.

Reading the obtained results indicated a strong and acceptable effect, correlation, or participation of the items in the study variable (autism). Most items contributed to or influenced the construct by more than 71%. The highest saturation value was for item with a value of 1.67, and the lowest saturation was for item with a value of 1.12 (الهوري, 2021).

Assessment of Basic Language and Learning Skills - Revised ABLLS-R:

This is a guidance manual for drafting an Individualized Educational Program (IEP) and a system for listing and evaluating skills in children with learning difficulties. It analyzes many basic skills for successful communication and learning based on daily experiences, and it consists of two separate documents (Partington, 2010).

The Training Program:

This training program is based on involving parents in the Applied Behavior Analysis (ABA) program to reduce the degree of autism in their children. The sessions were structured according to the ABLLS-R scale, and the intervention follows the methodology of Ivar Lovaas, or the ABA program. The program consists of 15 sessions, each lasting approximately 1 hour, at a rate of once every two weeks. It was presented to a group of expert reviewers.

7. Study Methodology:

We relied on the Case Study Method, which is the framework in which the clinical specialist organizes and evaluates all the information and results obtained from the subject through: observation, interview, social history, biography, psychological tests, and medical examinations (Lewis, 1980).

The current study also relies on the Quasi-Experimental Method, which is based on conducting what is called a scientific experiment. This involves testing the extent of the effect of a specific experimental factor or variable that is intended to be measured through the scientific experiment on a small, limited scale to determine its impact before generalizing its use, in the form in which it was tested, to the entire society.

8. Case Presentation:

Personal Data:

- Name: A. Y.
- Gender: Male
- Age: 37 months
- Birth Order: Only child

Family Data:

- Father: Age 32, employed (civil servant).

- Mother: Age 23, high school level (3rd secondary), housewife.
- No kinship relationship exists between the parents.
- No prior family history of illnesses was recorded.

Developmental History of the Case:

1. Medical History: The child frequently experienced high body temperature.

2. Information on Pregnancy, Birth, and Breastfeeding Conditions:

The pregnancy was desired and medically monitored, though there were some family problems that affected the mother's mood. The birth was completely normal after full term, and the child's weight was about 3.1 The breastfeeding period also passed normally. Weaning occurred at one and a half years old.

3. Manifestations of Physical, Motor, and Sensory Development:

Sleep has been unstable since birth. General health is good. Motor development milestones (sitting, teething, standing, walking) were normal. Toilet training is not acquired; he does not control his bladder and bowel movements. He always prefers listening to music and songs on television. As for visual and olfactory stimuli, he does not pay attention to anything.

4. Manifestations of Linguistic Development:

His speech consists of syllables, some understood and others not. He does not initiate conversation with others and often screams and cries when attempts are made to talk to him, with a deficit in understanding the meaning of some words.

5. Manifestations of Social Development:

He only has a relationship with his mother and grandmother. He tends toward isolation, refuses to play with children, and lacks smiling.

6. Manifestations of Psychological Development:

He is constantly attached to his mother and becomes highly agitated when prevented from engaging in preferred activities, when a toy is taken, or when his desires are not met, indicating a significant inability to tolerate frustration.

7. Manifestations of Cognitive Development:

He can identify body parts by pointing to each part with his hand.

Main Complaint:

The main complaint is summarized as: frequent crying, tendency towards isolation, an unusual way of playing, strange arrangement of objects (such as arranging shoes in a curved line), temper tantrums, sleep disturbance, and making disturbing noises. The problem started to be felt after the third year, when the clear clinical picture of the autistic child began to emerge, including a deficit in communication and some behavioral problems.

Psychological Examination Results:

Upon examination, the child suffered from most symptoms of Autism Spectrum Disorder mentioned in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders DSM-5, which are:

- Inability to tolerate frustration, and episodes of crying and anger that sometimes reach the point of self-harm.
- Spinning around himself.
- Stereotyped movements.
- Language consists of some syllables with the absence of any other expressive or communicative means.
- Using the hand of the other (hand-over-hand prompting) when wanting something.
- Tendency towards isolation.
- Absence of smiling.
- Strange facial gestures appearing.
- Playing in a strange way.
- Walking on tiptoes.
- Disturbance in feeding, in addition to eating paper from books.

The case was referred to a child psychiatrist to rule out any neurological or auditory deficits and to confirm the absence of co-occurring disorders.

After confirming the diagnosis of Autism Spectrum Disorder, the degree of autism was measured by applying the Childhood Autism Rating Scale (CARS), where the total score was 40.5. This indicates severe autism according to the scale's classification scores. Behavioral problems, specifically the crying fit, were then identified, and the Individualized Educational Program (IEP) was constructed using the Assessment of Basic Language and Learning Skills (ABLLS-R) scale. Following this, the parents were trained on the techniques of the Applied Behavior Analysis ABA program.

Therapeutic Sessions:

Session	Focus Area	Techniques Used	Goal(s)	Key Procedures and Notes	Result
1	Psychological Examination	Observation, Purposeful Play	Collecting information about the family and the child.	Observation of symptoms DSM-5, parent interview, building a positive therapeutic relationship.	Diagnosis confirmed (Severe ASD, CARS score 40.5).
2	Diagnosis	Observation, Purposeful Play	Identifying reinforcers, strengths,	Identification of reinforcers (ball, carrots, praise). Discussion of	Initial data collected for IEP planning.

Session	Focus Area	Techniques Used	Goal(s)	Key Procedures and Notes	Result
			weaknesses, and behavioral problems.	parental consistency. Identification of strengths (fine motor skills) and weaknesses (low frustration tolerance, refusal of proximity, crying fits).	
3	Therapeutic Contract	Observation	N/A	Advice given: Enroll in kindergarten, reduce screen time, frequently alert/prompt the child. Building rapport with the child and explaining the ABA program to the parents. Parents sign the authorization.	Therapeutic agreement established.
4	Pre-Measurement	Observation	Evaluating skill level to build the Individualized Program.	Application of CARS Score 40.5 - Severe Autism. Evaluation of foundational skills using ABLLS-R.	Confirmation of the baseline (Pre-measurement)
5	Therapeutic Education	Cognitive Restructuring, Guidance	N/A	Addressing the mother's guilt (Cognitive Restructuring). Discussing the possibility of school enrollment and its conditions. Providing detailed information about ASD as a neurological disorder.	Mother's guilt alleviated; knowledge base expanded.
6	Therapeutic Education	Guidance	Providing information about the program and the techniques used.	Explanation of ABA techniques: Reinforcement, Task Analysis (Chaining), Shaping, Prompting/Instruction. Guidance on the priority of teaching skills .	Parents informed about the ABA framework.

Session	Focus Area	Techniques Used	Goal(s)	Key Procedures and Notes	Result
7	Foundational Skills	Prompting, Positive Reinforcement, Modeling, Errorless Learning	Teaching the child how to learn.	Training on Manding (Requesting) (using reinforcers, generalization). Training on Tacting (Naming) (unifying names, starting with preferred items). Training on Modeling for parents.	Child learned to request (e.g., "Atini" / "Give me"), and named "Ballon" (Ball).
8	Foundational Skills	Positive Reinforcement, Modeling, Incidental Teaching	Developing social interaction and communication.	Training on Motor Imitation (e.g., clapping, simple movements). Training on Vocal Imitation (e.g., "Mama," "bravo," using tangible objects to prompt). Training on Incidental Teaching for parents.	Child learned motor imitation (waving, clapping) and vocal imitation ("bravo," "Mama," "Atini").
9	Foundational Skills	Prompting, Positive Reinforcement, Modeling, Incidental Teaching	N/A	Training on Social Interaction (greetings, goodbyes, using gradual physical assistance). Training on Receptive Language (following instructions, focusing on reinforcers).	Child learned to greet, participate in play, and sometimes accept physical proximity.
10	Independence Skills	Shaping, Task Analysis, Positive Reinforcement	N/A	Training on Dressing/Undressing (starting with undressing, using sequential steps). Training on Eating Independence (holding a spoon, eating dry then liquid foods). Explanation of Task Analysis and Gradual Assistance.	Child learned to take off and put on some clothing items with minimal assistance.

Session	Focus Area	Techniques Used	Goal(s)	Key Procedures and Notes	Result
11	Independence Skills	Shaping, Task Analysis, Positive Reinforcement	N/A	Training on Hygiene (washing face/hands using Task Analysis/Chaining). Emphasizing gradual assistance and direct reinforcement.	Child learned to wash hands, face, and feet with little assistance.
12	Motor Skills	Play, Differential Reinforcement, Positive Reinforcement	Developing fine motor movements and visual perception.	Training on Fine Motor Skills (e.g., turning pages, coloring, pencil grip). Training on Gross Motor Skills (involving the child in daily activities like household tasks).	Child learned to unbutton, open doors, hold a spoon/pencil, and color within the lines.
13	Academic Skills	Shaping, Positive Reinforcement	N/A	Training on Arithmetic (counting up to three, using concrete objects for comprehension). Encouraging the mother to generalize counting activities at home.	Child was able to recognize and name some colors, count up to six, and recognize shapes.
14	Behavioral Problems	Shaping, Positive Reinforcement	Reducing the problem behavior (crying).	Functional Behavior Analysis (FBA) of crying (function: escape/frustration, attention-seeking). Intervention for frustration: Containment/Hugging. Intervention for attention: Ignoring Technique (applied by family).	Crying reduced by 30% (according to the mother's estimation).
15	Post-Measurement	Childhood Autism Rating Scale CARS	Post-measurement.	Reapplication of the {CARS scale using observation and activities.	CARS score was 38, still indicating severe autism.

Interpretation and Discussion of Results The Hypothesis:

Based on the preceding information and by comparing the results of the pre-measurement with the results of the post-measurement, it became clear to us that the research hypothesis was achieved: Involving parents in the Lovaas program is effective in reducing the degree of autism in their children.

This means that training on the therapeutic program led to an improvement in the child's condition. In this program, we relied on building a positive relationship for the child with people and places, providing assistance and reinforcement, in addition to training parents to involve the child in all daily life activities.

Based on this, we mention the most important studies whose results align with our findings. In this regard, we find:

- The study conducted by specialist Mohammed Al-Huddiyan (2016) on how to help children with special needs. He concluded that parental involvement yields immense benefits for children with special needs, and it also benefits the parents and the school greatly.
- The positive results we obtained may also be due to the nature of the training program, which can be understood and applied by parents as partners in the therapy. This is confirmed by the study of Legros Claire (2008), which affirmed the effectiveness of parental involvement in the Applied Behavior Analysis (ABA) program. By applying the program to a sample of ten 10 children, the results showed differences in the pre- and post-measurements on the Childhood Autism Rating Scale (CARS), which indicates the effectiveness of the ABA program in modifying the behavior of children with autism.

Key factors that contributed to the effectiveness of parental involvement in the Applied Behavior Analysis program in reducing the degree of autism in their children are the following:

- Motivation and desire on the part of the parents to learn about the therapeutic programs in order to help their children.
- The intervention of the parents occurred in the natural environment by involving the children in daily activities, which enhances learning.
- Ease of training on the Applied Behavior Analysis program and the possibility of its application by parents, given its reliance on the principles of behavioral theory.
- Parents have a great ability to assess their children's needs and desires, and they can easily communicate with and understand their children's expressions.
- The parents' feeling and belief that their child can live a normal life, integrate into society, and interact with them if they receive appropriate care.
- The nature and quality of the activities and behavior modification methods that were coordinated, prepared, and trained for the parents to implement.

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