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# The Effectiveness of a Mothers' Training Program That Is Based on the Strategy of Discrete Trials on the Manding and Motor Imitation Skills of Children with Autism Spectrum Disorder

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**Abstract**

**Purpose:** The purpose of this study is to identify the effectiveness of a training program for mothers on improving the manding and motor imitation skills of children with autism spectrum disorder.

**Materials and Methods:** This study followed the quasi-experimental approach; one-case design with a pre-, post- and follow-up test. The sample consisted of (8) mothers and (10) of their autistic children from emirate of Ajman, UAE. The researchers validated the study tool, which was the scale of manding and motor imitation, consisting of (56) items. The researchers also created a valid training program for mothers based on the strategy of Discrete Trials.

**Findings:** The results revealed significant differences of the total scores on the scales of manding (12.3 degrees) and motor imitation skills (14.5 degrees) after applying the training. Also, there were statistically significant differences between the total scores of post and follow-up measurements for the skills of manding (1.9 degrees) and motor imitation (1.4 degrees).

**Implications to Theory, Practice and Policy:** This study enhances parents' enrollment in their children rehabilitation programs and helps the specialists to achieve their goals faster. Children with disabilities could be effevtively engaged in their programs than before.

**Keywords:** *Autism, DDT, Motor Imitation, Manding (I24)*

## 1.0 INTRODUCTION

Autism Spectrum Disorder (ASD) is defined by deficiencies in social interaction and communication skills, and limited interests and activities. The sum of the deficiencies constitutes factors affecting people's acquisition of other important skills, represented by deficiencies in manding skills, motor imitation skills, and the development of social skills that contribute to acquire and learn important social behaviors (Bush, 2017). These reasons are viewed by specialists as constituting obstacles to children's progress and development in acquiring skills and generalizing them to many different environments and family situations (Al-Sarour & Amira, 2018).

Manding and motor imitation skills are among the basic learning skills that children with autism must possess in order to acquire more complex skills, such as learning abilities (McDowell, et al., 2015; Ingersoll & Schreibman, 2006), language acquisition and communication skills (Samane & Soleymani, 2018), communication skills and social interaction (Escalona, 2002). Many children with autism show challenges in manding skills in their daily life and challenges in motor imitation skills with people around them. Manding skills are the skills of expressing a person's desire for something. It can be performed through many ways; pointing, naming, expressive and receptive language, and other skills that require communication to do (Heflin and Alaimo, 2011; Partington, 2006). Motor imitation skills are the skills that a child is trained on by executing physical movements identically using an imitated model in front of him. The appearance of the required imitated model should be followed within seconds of its immediate presentation (Cooper, et al., 2014).

Training and dealing with children with autism on these tasks poses a challenge to all members of his family, and increases the burden and responsibility on the family, especially when the family lacks sufficient knowledge and experience in training the child effectively, which constitutes an obstacle to progress the child in various skills, therefore, this requires specialists to bear responsibility in how to achieve cooperation with the children's families with the aim of establishing a participatory relationship to help them accept the children regardless of their developmental disability (El-Zraigat, 2015).

ASD is one of the categories of special education that has sparked controversy in the fields of scientific research regarding its causes, prevalence rates, and effective methods to deal with. In recent years, ASD has witnessed widespread interest from specialized researchers and trainers, which has led to the emergence of many effective training programs that raise the level of quality of services provided to them. However, most of these services were not focused on the families and were not based on their participation in applying it in an organized and sequential manner. Many reasons stand in front of that; the specialists' perception that there is no desire to participate and follow up on the part of the family, considering that their training is a waste of time and effort; the little family's time and energy to attend the training and administer it; in addition to the set of pressures imposed on families, to which training is an additional pressure.

Many studies have indicated the importance of educating and training families of children with autism on the most important therapeutic methods and skills that are compatible with their abilities, as training them represents an important part in dealing with children and evaluating their behavior, which contributes to their quick and easy reintegration into society. Because family training is reflected positively on the development and progress of children, parents must be supported, guided, and trained in the best methods and therapeutic programs, which in turn achieves many

benefits for the child, his family, and specialists. When the family is trained to complete what the child was trained to do in the center, the level of generalization of the child's responses to different environments raises and lasts, and thus the child transfers the impact of this learning from the center to the home easily (Bush, 2017).

Discrete Trials Training (DDT) are among the educational strategies that have proven effective in training autistic children to acquire many different challenging skills, such as: language, daily life, gross and fine motor, and imitation (Rabideau et al., 2018; McKenney et al. 2019). DDT helps to teach children with autism the correct responses and behaviors in different situations, it can be used at home, not only in therapeutic sessions. Smith (2001) indicated that DDT is a scientific strategy used to teach skills to students with autism in a planned manner, and within a specific methodology, through which the skill is trained in simplified and organized steps instead of training it all at once; the skill is divided and reconstructed tin order to teach each step in each attempt.

**Problem Statement**

Hence, in view of the difficulties that autism imposes on children in acquiring the automatic skills that typical children acquire, and in view of the role of the DDT with improving these skills by trainers or students' family and natural environments, this study comes to measure the effectiveness of a training program for mothers using DDT in improving the level of manding and motor imitation skills among children with autism. The mothers were chosen in particular because they are more caring than fathers, based on our field experience. Also, the fathers are busier in work, therefore have less time.

## 2.0 LITERATURE REVIEW

Many research studies have tested the effects of training programs provided by parents on their autistic children's skills of manding and motor imitation. Ostrosky Zaghlawan (2016) conducted a study that aimed to evaluate the effect of therapeutic intervention provided by a parent on their children's imitation skills. The sample consisted of 30 families of children with ASD. Two families were selected, their children were (3) years and (5) years who achieved a low score on the motor imitation scale. Neither of them has hearing, vision, or physical problems. The study focused on parents interacting with their children using 7 sets of games through imitation. A camera was placed in the room to record their video responses. The results of the study indicated an increase in the level of children's imitation skills related to imitating the correct use of objects, imitating gestures, imitating the correct use of language, and the correct use of random imitation.

Ingersoll and Gergans (2007) conducted a study aimed to train mothers on reciprocal imitation (RIT) skills with their autistic children, and to evaluate the effectiveness of the intervention at several levels. The study sample included (3) children aged between (2-3) years. The children were evaluated on the motor imitation scale, their developmental age and severity of their disorder were assessed. The mothers in the training stage were provided with a training guide and necessary tools. They were trained in the method of mutual imitation and imitation using objects with their children at the center and at the home. All evaluation and training sessions were recorded. The results showed an increase in the rate of mothers implementing imitation skills with their children, as all mothers generalized imitation skills to the home, which led to improve children's imitation skills, communication skills, manding, social interaction and play.

Abdat et al., (2017) conducted an experimental study aimed to test the effectiveness of the training program using the DTT strategy in developing the skills of identical motor imitation, receptive language, verbal imitation, and expressive naming among autistic children. The study sample consisted of (8) children enrolled in government centers for the rehabilitation of people with disabilities in the UAE, their ages ranged between (6-8) years. The study tools included The Behavioral Language Assessment Form (BLAF) and a training program based on DTT strategy. The results indicated that there were differences in motor imitation skills, matching skills, and receptive language in favor of the experimental group based on the training program. There were no statistically significant differences in verbal imitation and expressive naming among members of the same group.

(Fryling et al., 2017) conducted a study aimed to train mothers of children with autism on the DTT strategy and evaluated the effects of the training on teaching behavioral skills and generalizing the training on educational programs. The sample included (3) mothers in Saudi Arabia. The mothers were characterized as having no prior experience in Applied Behavior Analysis (ABA) in general and in DDT in particular. The children were one female and two males whose ages ranged between (6-9 years). Children's data were collected before starting the training using Assessment of Basic Language and Learning Skills (ABLLS-R). A baseline was designed for each child, and the mothers were given a written list that included all the steps of DTT. Each child was trained on the targeted skills that presented to the mothers by the trainer. The results indicated an improvement in behavioral skills, and their generalization. The continuity of skills was maintained during the two-week follow-up period.

Sturmey & Lafasakis (2007) conducted a study aimed to train mothers of children with developmental disorders on the DTT strategy and on effective behavioral skills. The sample included (3) mothers in the state of Nigeria. Their children ages around 4 years and they had weak imitation skills. They were not subject to any drug treatment and had not been previously trained in the strategy of DTT. All mothers confirmed that they had no previous experience in training their children using DDT. They were evaluated before starting the training program on practicing the skills of imitating fine movements and vocal imitation. They also underwent evaluation after completing the program. The results of the study indicated that training the children's mothers on behavioral skills was highly effective. The children showed an improvement in performance during their training. This affected their level of performance in imitating fine movements and vocal imitation, and this also had a positive impact on the generalization of the children's responses. They showed correct responses to the educational programs and showed better correct responses with their mothers after their training compared to what they were in the baseline.

**Research Gaps**

The studies we reviewed were compatible regarding the positive effect of parents' training program on the different skills among disabled children. Few studies investigate the positive effect of parents' training program on the different skills among disabled children in UAE. This study asked the following question: How effective is a training program for mothers based on the strategy of DDT in improving the level of manding and motor imitation skills in children with autism? Based on this main question, three questions were derived: 1. Are there statistically significant differences at the level ($\alpha = 0.05$) in the level of manding skills among children with autism due to their mothers' training on the DDT? 2. Are there statistically significant differences at the level ($\alpha = 0.05$) in the level of motor imitation skills among children with autism due to their mothers' training on the DDT? 3. Are there statistically significant differences at the level ($\alpha = 0.05$) on the

follow-up measurement in the level of manding skills and motor imitation among children with autism due to their mothers' training on the DDT? See Figure (1).

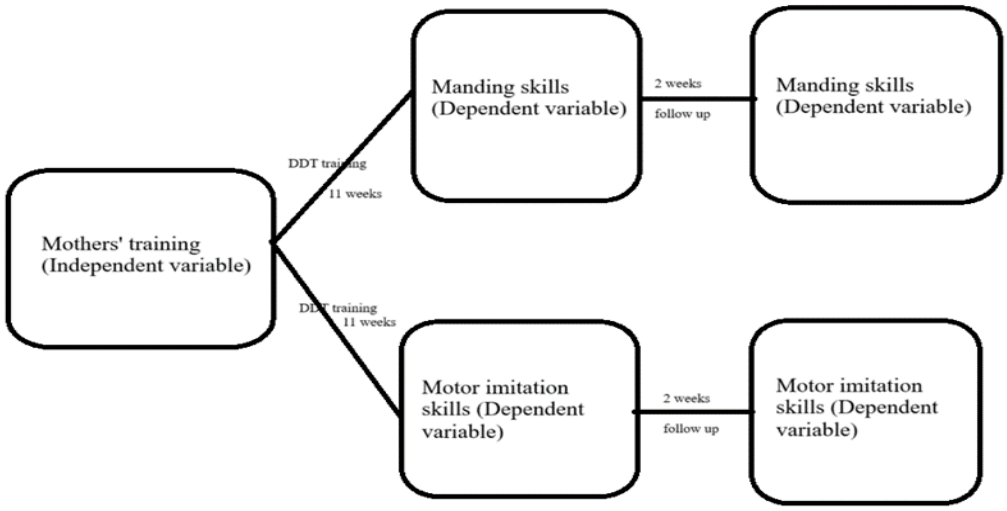


*Figure 1: The Study Theory*

## 3.0 MATERIAL AND METHODS

This study followed the quasi-experimental approach; one-case design with a pre-, post- and follow-up test, which is considered the most appropriate for the objectives of this study. It is characterized by the absence of a comparison group or the use of allocation or randomization in choosing the study sample. This study also considered the independent variable represented by the training program for mothers and observed its effects on the two dependent variables: the level of manding skills and motor imitation. The pre-test was applied to all members of the study sample. After completing the training program, the post-measurement was applied to the sample members again, and the follow-up measurement was applied a month after the application on the same sample of children. The study started on May 8th, 2023, and finished on January 11th, 2023. The study population consisted of (120) children diagnosed with autism who do not receive therapeutic services in special education centers and whose names are listed on waiting lists in centers in the Emirate of Ajman - the United Arab Emirates. A convenience sampling technique was used to select the sample. It considered the age of the child, the level of disorder, and not receiving training and therapeutic services. Sample's children aged between (4- 6) years of those who obtained a criterion of less than 80% on the pre-measurement in the basic areas on the two scales of pre-manding and pre-motor imitation skills. The sample included (8) mothers and their 10 children and it was considered when choosing them that they did not have the training competencies to train their children, and that they had a desire for training to develop their skills in the therapeutic methods specific to their children.

To achieve the objectives of the current study and answer its questions, the researchers validated two tools: Manding Skills Scale and Motor Imitation Skills Scale. The scales aimed to measure

the level of manding skills and the level of motor imitation skills. Its items were built based on the Assessment of Basic Language and Learning Skills (ABLLS) protocol, one of the tools designed to develop a set of basic and functional skills in children who suffer from autism and other developmental disabilities for the age group (3-9) years, which was developed by James Partington and Mark Sundberg (James Partington in 1998). It is considered a standard reference assessment protocol because it depends on measuring the student's current level of performance of skills and monitoring his progress. The scales consisted in their final version of (29) items covering the dimensions of manding skills, and (27) items covering the dimensions of motor imitation skills. The tool was presented to a group of arbitrators with specialization in the field of special education, they reviewed it and judged it in terms of accuracy, translation, suitability to the Emirati environment, and the extent to which the items relate to the dimension. To verify the implications of the validity and reliability of the scale's items, it was applied after being judged on a pilot sample of (30) male and female children with autism at various levels of severity enrolled in the Reyadah Center for rehabilitation, ages 4-9 years and outside the study sample of children.

The scales corrected using a five-point Likert scale whereby 0 = the child does not possess the skill, and from (1-4) if the skill is present. The more the item applies to the student, the higher the score is given to him (direct proportionality. Eventually, a scale with class length= 1 was used to judge the results, which was divided into: (high, medium, low, and very low), where; (0-.99) indicated very low degree of applicability, (1- 1.99) indicated low degree of applicability, (2- 2.99) indicated average degree of applicability, and (3-4) indicated high degree of applicability.

**The Study Tool Reliability**

The reliability of the manding scale was verified by calculating the scale's internal consistency coefficient based on the Cronbach alpha equation for internal consistency and rather reliability. It was applied to the pilot sample by applying the scale through assessors to the same survey sample members. The Pearson correlation coefficient is calculated between the assessors' application. The value of the Cronbach alpha coefficient was (0.985), while the raters' reliability method was (0.984). These values are very close to the reliability coefficient values of the scale in its original version (Partington, Bailey and Partingto, 2016). The internal consistency value was (0.90). The correlation coefficients were positive and statistically significant; therefore, the scale was approved in its final form of (29) items. Table (1) explains these implications.

**Table 1: Implications of Rater Reliability and Internal Consistency of the Dimensions of the Manding Scale**

| Number | Dimension | Pearson correlation | Cronbach alpha |
|---|---|---|---|
| 1 | Manding scale | .984 | .985 |

***P-Value at 0.01*

To ensure the reliability of the motor imitation scale, the internal consistency coefficient for the scale was calculated based on the Cronbach alpha and the Pearson correlation also. Their values were (0.986), and (0.987) respectively. These values are very close to the reliability coefficient values of the scale in its original version (Partington, Bailey, and Partingto, 2016). The internal consistency value was (0.90). The correlation coefficients were positive and statistically significant; therefore, the scale was approved in its final form of (27) items. The appendix shows the scales in their final form. Table (2) shows these implications.

**Table 2: Implications of Rater Reliability and Internal Consistency of the Dimensions of the Motor Imitation Scale**

| Number | Dimension | Pearson correlation | Cronbach alpha |
|---|---|---|---|
| 1 | Motor imitation scale | .987 | .986 |

***P-Value at 0.01*

### Training Program

The training program aims to train mothers of children on the DDT to improve the level of manding and motor imitation skills of their children with autism. The program was built by referring and reviewing the Arabic and English theoretical and practical frameworks related to the techniques of working on the strategy of DDT, the researchers reviewed their scientific content, such as (Jensen, 2002); (Karlen, 2014); (Cooper et al., 2014); (Smith, 2001); Heflin and Alaimo, 2011) and (El-Zraigat, 2015).

The training program included theoretical and practical training sessions that is implemented in an organized and planned manner, with a specific timetable. It consisted of twenty-three individual training sessions and group sessions over the course of (11) weeks. It is presented in two group sessions per week, the duration of the session was 90 minutes, meaning a total of (33) group training sessions with (50) training hours. For the purposes of achieving the objectives of the study, pre- and post-measures are applied to the children, and a follow-up measurement is conducted one month after the end of the training from the post-measures on the children.

## 4.0 FINDINGS

The Statistical Package for Social Science (SPSS) software was used to analyze the data. Table (3) shows descriptive statistics for the sample regarding child's gender, child's age, disorder severity, income, mother age, family size, mother's educational level and mother's marital status. In terms of children, 50% were males, 60% aged 4-5 years; 60% at the first level of disorder. In terms of parents, 60% had a low income. 40% of the mothers were between 30-40 years. 60% of them had a bachelor's degree. And 60% of them were married. 60% of the families included 4-6 people.

**Table 3: The Results of the Statistical Analysis**

| Variable | Category | Number | Variable | Category | Number |
|---|---|---|---|---|---|
| Child's gender | Male | 5 | Child's age | 4-5 | 6 |
| | Female | 5 | | 5-6 | 4 |
| | Total | 10 | | Total | 10 |
| Disorder's severity | First level | 6 | Income | Low | 6 |
| | Second level | 3 | | Moderate | 2 |
| | Third Level | 1 | | high | 0 |
| | Total | 10 | | Total | 8 |
| Mother's age | 20-30 | 3 | Family size | 1-3 persons | 2 |
| | 30-40 | 4 | | 4-6 Persons | 6 |
| | More than 40 | 1 | | More than 6 persons | 0 |
| | Total | 8 | | Total | 8 |
| Mother's education level | High school or below | 0 | Mother's marital status | Married | 6 |
| | Diploma | 2 | | Separated | 2 |
| | Bachelor | 6 | | Widowed | 0 |
| | Total | 8 | | Total | 8 |

**Results Related to the First Question**

The arithmetic means and standard deviations were extracted, which include the level of skills (manding) for the total scores of the sample members in (the pre- and post-measurement). The Table (4) shows these results.

**Table 4: The Arithmetic Means and Standard Deviations for Level of Manding on the Pre- and Post-Measurement**

| Measure | Arithmetic mean | Standard deviations |
|---|---|---|
| Pre-measurement | 1.40 | 3.44 |
| Post-measurement | 13.70 | 3.75 |

The table shows apparent differences between the arithmetic averages of the total scores of the study sample members on the (manding) skills in the pre- and post-measurement (12.3) degrees in favor of the post-performance. To verify whether these differences were statistically significant, the Wilcoxon test for correlated samples was used. See Table (5).

**Table 5: Results of the Wilcoxon Test for Correlated Samples for Manding Skill**

| Rank | N | Mean Rank | Sum of Ranks | Z | Asymp. Sig. (2-tailed) |
|---|---|---|---|---|---|
| Negative ranks | 10 | 5.50 | 55.00 | -2.807 | .005 |
| Positive ranks | 0 | .00 | .00 | | |
| Ties | 0 | | | | |
| **Total** | **10** | | | | |

***P-Value at 0.05*

It is clear from the table that there are statistically significant differences between the pre-measurement and the post-measurement on the total score of the scale for manding skills, where the Z value was (-2.807), at the significance level ($\alpha = 0.05$). The differences were in favor of the post-measurement; this demonstrates the effectiveness of the training program on improving the manding skills. Table (6) shows the level of performance for each child on manding skills.

**Table 6: The Performance of the Children on the Manding Skills Scale in Pre and Post Measurements**

| **Dimension** | **Manding skills** | | |
|---|---|---|---|
| **Degree** | **(Total marks= 116)** | | |
| **Sample members** | **Pre-performance** | **Post-performance** | **% of improvement** |
| 1st child | 11 | 19 | 8% |
| 2nd child | 2 | 12 | 10% |
| 3rd child | 0 | 17 | 18% |
| 4th child | 2 | 13 | 14% |
| 5th child | 0 | 17 | 18% |
| 6th child | 1 | 16 | 16% |
| 7th child | 0 | 11 | 11% |
| 8th child | 0 | 5 | 5% |
| 9th child | 0 | 15 | 16% |
| 10th child | 0 | 14 | 15% |

It is noted from Table (6) that the third and fifth children have obtained the highest percentage of improvement compared to the sample members in manding skills, which is estimated at (18%). They are followed by the sixth and ninth children, whose improvement percentage is estimated at (16%), followed by the tenth child, his improvement rate is estimated at (15%), then the fourth child with an improvement of (14%), followed by the seventh child, which is estimated at (11%), followed by the second child, with an improvement rate estimated at (10%). Then the first and the second children with an improvement rate at (8%). The eighth child obtained the lowest improvement rate, estimated at (5%).

The researchers believe that the difference in the results of children's performance and progress is due to the nature of each child's individual characteristics, which are diverse and different. In addition to differences in commitment between the mothers, this was observed during the training in attending training sessions and applying the strategies and the methods of the program accurately. Also, there are differences in the total hours of training provided to the children, according to what the mothers provided, child's cooperation during the training and the mother's continuation of the sessions with firmness and precision despite the child's refusal of the session. All of what was mentioned had an impact on this discrepancy in the results recorded by the students regarding the rates of improvement in the post-test.

These results came to confirm the effectiveness of the proposed training program in improving the level of manding skills among children with autism. The researchers attribute this result to the opportunity provided by the proposed training program, which is based on scientific strategies confirmed by relevant research and studies especially since the program was presented to children individually in their natural environments and with people familiar to them, namely their mothers, in addition to the mothers' keenness to provide the best for their children, represented by the

commitment of most of them to attend group training sessions, and the commitment to performing individual sessions at home and follow-up with the researchers to discuss the details of the sessions and address the problems that may arise during the training immediately. It may also be attributed to the fact that they did not have opportunities like others with the disorder to receive any type of similar educational programs that works to raise their competence in this aspect. The positive effect of the training program that appeared on the students' levels of post-performance may also be attributed to the nature of the tasks that were presented to the students, which were presented individually and considered the level of each student individually according to the results that the students had obtained before starting the treatment plan.

**Results Related to the Second Question**

The arithmetic means and standard deviations were extracted, which include the level of skills (motor imitation) for the total scores of the sample members in (the pre- and post-measurement). Table (7) shows these results.

**Table 7: The Arithmetic Means and Standard Deviations for Motor Imitation on the Pre- and Post-Measurement**

| Measure | Arithmetic mean | Standard deviations |
|---|---|---|
| Pre-measurement | 1.30 | 1.64 |
| Post-measurement | 15.80 | 7.27 |

The table shows apparent differences between the arithmetic averages of the total scores of the study sample members on the (motor imitation) skills in the pre- and post-measurement (14.5) degrees in favor of the post-performance. To verify whether these differences were statistically significant, the Wilcoxon test for correlated samples was used. The following table shows the results:

**Table 8: Results of the Wilcoxon Test for Correlated Samples for Motor Imitation Skill**

| Rank | N | Mean Rank | Sum of Ranks | Z | Asymp. Sig. (2-tailed) |
|---|---|---|---|---|---|
| Negative ranks | 10 | 5.50 | 55.00 | -2.805 | .005 |
| Positive ranks | 0 | .00 | .00 | | |
| Ties | 0 | | | | |
| **Total** | **10** | | | | |

***P-Value at 0.05*

It is clear from Table (8) that there are statistically significant differences between the pre- and the post-measurements on the total score of the scale for motor imitation skills, where the Z value was (-2.805), at the significance level ($\alpha$= 0.05). The differences were in favor of the post-measurement; this demonstrates the effectiveness of the training program on improving motor imitation skills. Table (9) shows the level of performance of each child on motor imitation.

**Table 9: The Performance of the Members on the Motor Imitation Skills Scale in the Pre and Post Measurements**

| Dimension | Motor imitation skills | | |
|---|---|---|---|
| Degree | (Total marks= 108) | | |
| Sample members | Pre-performance | Post-performance | % of improvement |
| 1st child | 0 | 27 | 34% |
| 2nd child | 4 | 19 | 19% |
| 3rd child | 2 | 21 | 24% |
| 4th child | 0 | 10 | 13% |
| 5th child | 1 | 12 | 14% |
| 6th child | 4 | 20 | 20% |
| 7th child | 2 | 17 | 19% |
| 8th child | 0 | 5 | 6% |
| 9th child | 0 | 24 | 30% |
| 10th child | 0 | 10 | 13% |

It is noted from Table (9) that the first child has obtained the highest percentage of improvement compared to the sample members in motor imitation skills, which is estimated at (34%). He is followed by the ninth child, whose improvement percentage is estimated at (30%), followed by the third child, his improvement rate is estimated at (24%), then the sixth child with an improvement of (20%), followed by the second and the seventh child, which is estimated at (19%), followed by the fifth child, with an improvement rate estimated at (14%). Then the fourth and the tenth children with an improvement rate at (13%). The eighth child obtained the lowest improvement rate, estimated at (6%).

The differences reflected in the post-measurement show that the children develop their imitation skills because of the training program. A recent attention to the time that mothers spend with their children in their natural social environment has made the trend toward family training and work at home a habit that allows workers and researchers to reliably predict subsequent gains in children with the disorder, and go beyond what children need from intervention strategies that focus on their presence within educational institutions only and expand to reach the family and work by focusing on scientific home teaching strategies based on evidence and reliable experiences. This conclusion is consistent with the results of the study of Abdat et al., (2017).

**Results Related to the Third Question**

The arithmetic means and standard deviations were extracted, which include the level of skills (manding and motor imitation) for the total scores of the sample members in (the post- and follow up-measurement). The table below shows these results.

**Table 10: The Arithmetic Means and Standard Deviations for Level of Manding and Motor Imitation on the Pre and Follow Up –Measurements**

| Measure | Manding | Motor imitation |
|---|---|---|
| Post-measurement | 13.70 | 15.80 |
| Follow up-measurement | 15.60 | 17.20 |

It is clear from the table that there are apparent differences between the arithmetic averages of the total scores of the study sample members on the (manding and motor imitation) skills between the

post- and follow up measurements. To verify whether the differences were statistically significant between members of the study sample, the Wilcoxon test for correlated samples was used. The following table shows the results:

**Table 11: Results of the Wilcoxon Test for Correlated Samples to Indicate the Differences between the Two Measurements (Post and Follow Up) of Manding and Motor Imitation Skills**

| Skills | Rank | N | Mean Rank | Sum of Ranks | Z | Asymp. Sig. (2-tailed) |
|---|---|---|---|---|---|---|
| Manding | Negative ranks | 2 | 2.75 | 5.50 | -1.763 | .078 |
| | Positive ranks | 6 | 5.08 | 30.50 | | |
| | Ties | 2 | | | | |
| | Total | 10 | | | | |
| Motor imitation | Negative ranks | 4 | 3.00 | 12.00 | -1.257 | 0.209 |
| | Positive ranks | 5 | 6.60 | 33.0 | | |
| | Ties | 1 | | | | |
| | **Total** | **10** | | | | |

***P-Value at 0.05*

It is clear from Table (11) that there are no statistically significant differences at the significance level ($\alpha = 0.05$) between the post-measurement and the follow up-measurement on the level of manding and motor imitation. This proved the continuity of the effect of the training program. Table (12) compares the level of performance of each child on manding and motor imitation skills between the post-performance and follow-up performance.

**Table 12: The Performance of the Study Sample Members on the Manding and Motor Imitation Skills Scale on the Post and Follow Up Measurements**

| Sample members | Dimension | | | | | |
|---|---|---|---|---|---|---|
| | Manding skills (Total marks= 116) | | | Motor imitation skills (Total marks= 108) | | |
| | Post-performance | follow-up performance | % of improvement | Post-performance | follow-up performance | % of improvement |
| 1st child | 19 | 23 | 4% | 27 | 31 | 5% |
| 2nd child | 12 | 15 | 3% | 19 | 26 | 9% |
| 3rd child | 17 | 15 | -2% | 21 | 18 | -4% |
| 4th child | 13 | 19 | 6% | 10 | 8 | -3% |
| 5th child | 17 | 14 | -3% | 12 | 11 | -1% |
| 6th child | 16 | 18 | 2% | 20 | 24 | 5% |
| 7th child | 11 | 14 | 3% | 17 | 16 | -1% |
| 8th child | 5 | 5 | 0% | 5 | 3 | -3% |
| 9th child | 15 | 19 | 4% | 24 | 26 | 3% |
| 10th child | 14 | 14 | 0% | 10 | 9 | -1% |

The researchers attribute the high difference between the post and follow-up measurement to what distinguished the training program provided to mothers. Developing generalization skills, which students with autism lack, would contribute to transferring the impact of what the student learns from one environment to another and from one skill to another. For example, the student's mastery of the skills of imitating gross movements and generalizing this mastery would transfer the learning effect more easily to more difficult skills from the same program or other training programs such as imitating fine movements. This result is supported by a study (Fryling et al.,

2017), which aimed to train mothers of children with autism on the DTT strategy, to evaluate the effect of its application by mothers on training behavioral skills and generalizing the training on the educational programs for their children. The results showed an improvement in the children's behavioral skills, and in the skills that were not trained and generalized, the continuity of skills was maintained during the follow-up period over two weeks after the end of the study.

The researchers attribute the inequality between the children in the follow-up measurement to the mothers' commitment to following up on the program after its limited duration ends and the difference in the training hours provided to the child throughout the day; some mothers showed a clear reduction in the number of hours during the researcher's follow-up period to implement the program and after completing her home follow-up to implement it. In addition to the weakness of some students in the ability to generalize the skills mastered with the mother, which affected their appearance when the follow-up test was conducted, the students were able to master them with the mother and were unable to transfer the effect of learning with the researchers. Some students showed big differences in improvement in manding skills, because their mothers continued to work with them during playing and day-routine, which helped in generalizing the skill with the researchers. The researchers also attribute the high rates of improvement among children on the follow-up measurement to the experience acquired by mothers in providing training to their children, as the mother's ability to practice the program increases with the days and her experience and speed in performance increases compared to the beginning of the program. Also, a child's development raises the mother's motivation to work, as the mother begins to see and feel the positive results of her work with the child. This constitutes a motivation and incentive for him to work and thus his development becomes better. This is shown in the study (Ingersoll and Gergans, 2007) and its results, which indicated that increasing the rate of mothers implementing imitation skills with their children has led to children improving imitation skills, communication skills, social interaction, and play.

When looking at the level of progress on the follow-up measurement for each child individually, the difference is noted in the percentages of children's progress on the follow-up test on manding and motor imitation skills and what they included. It is noted that the follow-up measurement of motor imitation skills was higher compared to the follow-up measurement of manding skills. The researchers attribute this to the nature of imitation skills and the ease of implementing them throughout the day, in all places, and through playing, sitting, or other positions, compared to manding skills, which require more specialized tools and are therefore difficult to implement except through the child's presence in sessions that include specific educational materials.

The percentages of progress on the follow up measurement among students on manding skills ranged between (6 to -3), meaning that there were students whose improvement rates increased, and others decreased on the contrary. Through the researchers' observation and recording of the sessions and follow-up with the mothers, it became clear that the child undergoes at least two hours of training by the mother on the goals written by the researchers on a sporadic basis throughout the day, and that the mother has shown effort, commitment and perseverance throughout the period of the training programs. Their attendance at all group sessions amounted to (46) hours of training and approximately (20) individual hours, in addition to communicating by phone with the researchers personally. This conclusion is supported by the study of Ünlü et al., 2018, which stipulated that the sample include children diagnosed with autism who are less than 8 years old, and that their mothers and fathers must attend all training sessions because their commitment has positive results on the child's progress. For the students whose performance dropped by three

points, they did not show a response to all the skills mastered with the researchers during the follow-up measurement. Therefore, the mother was assisted in applying the follow-up measurement with the child in front of the researchers and sending videos to the researchers personally during their absence, which explains this by the child's inability to generalize the goals with a different person, which affected the results of the follow-up test.

For the percentages of progress on the follow up test among students on motor imitation skills, it ranges between (9 to -4), meaning that there are students whose improvement rates have increased, while others, on the contrary, have decreased. The researchers attribute these results to the effectiveness of the mother's training for her child through the strategy of DDT, the extent to which the mother shows discipline during the training period, her commitment to the researcher's recommendations, and her continuity in following up on the child's training after the completion of the training program. For the decline in the performance of another child, the researchers attribute it to a gradual decrease in the rate of training hours. From (5) hours at the beginning of the program to (60) minutes a day due to the mother's preoccupation with special family circumstances.

## 5.0 CONCLUSION AND RECOMMENDATIONS

### Conclusion

This study concluded that the training program for parents which is designed based on DDT has a significant effect on improving the levels of manding and motor imitation skills among children diagnosed with ASD in UAE. These results resembled those of previous studies in literature review part.

This study prepared a training program for mothers based on the DDT to improve manding and motor imitation skills in children with ASD, measured the effectiveness of the training program for mothers on improving manding skills and motor imitation, and measured the continuity of its effect one month after its implementation. Also, it developed a valid and reliable scale to measure manding and motor imitation skills among children with ASD. Limited research has been conducted in UAE on this issue. An awareness of mothers' training helps specialists to deal with parents better and helps parents to understand these issues more deeply.

### Recommendations

This study recommends: 1) organizing more courses that include training programs for families of children with ASD to develop their skills, especially families for whom it is not difficult to obtain services due to geographical, economic or social conditions. 2) communicating with centers, institutions and organizations to reach these families. 3) inviting workers in the field to pay attention to the role of the family and urging them to obtain everything new and include it in relevant workshops and courses and following up with families to ensure the transfer and dissemination of acquired skills among their children. 4) calling on researchers, when developing programs for children with autism, to focus on the follow-up aspect of their programs.

This study supports the role of DDT in improving the manding skills and motor imitation skills with children with autism. Also, it highlights the mothers' roles in their children rehabilitation. It helps the specialists to engage the families of children with special needs more. Also, it gives a recommendation to the decision makers to legislate policies supporting the parents' roles in their children rehabilitation journey.

This study does have some limitations: its small size, which resulted from difficulty in finding participants; and its lack of generalizability to other locations and cultures. It is highly recommended that more studies be conducted to investigate the parents' roles in their children's therapy plan in UAE.

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