

The Effectiveness of a Training Program based on Enhanced Milieu Teaching (EMT) in Improving Social Communication among a Sample of Children With Autism Spectrum Disorder in Jordan

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Abstract

This study aimed to investigate the effectiveness of a training program based on Enhanced Milieu Teaching (EMT) in improving social communication among a sample of children with autism spectrum disorder in Jordan. This study sample consisted of (4) children with Autism Spectrum Disorder aged between (6-10) years, were selected by deliberate manner. The researchers used the design of a single case study (ABA).To accomplish of the study objective the researcher was constructed (2) tools: Social Communication scale (34) items, and Enhanced Milieu Teaching Training Program to improving social communication and social interaction. Path analysis to children responses was used to answer the study questions. The result indicated that there is a statistically significant difference for the favor of posttest assessment to social communication scale due to Enhanced Milieu teaching program.

1. Introduction

Autism Spectrum Disorder is considered as of the most developmental disorder that affects growth, which affects children in early childhood, as it affects communication, social and behavioral aspects, where it is a complex disorder and has a lot of ambiguity with regard to its manifestations, causes and effects. Recently, autism spectrum disorder becomes used for any child diagnosed with autism , Asperger's syndrome or any general non-specific developmental disorders. Diagnostic and Statistical Manual of Mental Disorders (DSM5) indicated that diagnosis of autism spectrum disorder is based on two criteria instead of three, namely; inability to communicate and social interaction, difficulties in behavioral and interests patterns, limited activities and repetitive and stereotyped activities.

The new standards have stipulated that who diagnoses shall determine the level of severity of symptoms for the purposes of determining the level and type of service and rehabilitation they must provide; as the new standards included the broadening of the age range through which the symptoms appear to include the age of early childhood and extending until the age of eight years (American Psychiatric Association, 2013)

Hence, the most obvious problems for this category are the social problems, such as problems in the communicative side, visual communication with the mother or the lack of response to her smile, or the child may not show any response if the mother tries to communicate with the child, violent screaming and crying if someone tries to approach or touch him/her (Strock , 2004).They also suffer from problems in building relationships with others as compared to the normal child as an important diagnosis of autism; also social problems they suffer include those associated with the understanding of facial expressions and reading of non-verbal behaviors of others (Osten, 2008).

Child with autism spectrum disorder refuse others because he/she cannot communicate with them in a positive and effective way due to the fact that these children have not learned how to communicate with others, and that their attention and focus on the reception of others' messages weaken the possibility of constructive interaction with the surrounding social environment, in addition to that most children with autism spectrum disorder do not use social language as is the case with the other children. In addition to that they have a problem in the development of language, and often these difficulties lead. Children with autism spectrum disorder exercise typical behaviors largely as a result of poor communication skills or because of their focus on themselves and the inability to communicate with the social environment, as full engaging and is common among autistic children, in addition to that many of the children with autism spectrum disorder develop collect large amounts of one thing without employing it in some way, noting that any resistance to change or break the routine in the environment where the child used to play in leads to feelings of anxiety, depression and frustration among these children (Head. 2002).

As a result of the characteristics of children with autism spectrum disorder including the problems of the social and communicative skills which clearly affect the functional skills, independence and life it is necessary to provide a range of programs that work on the development of social and communicative skills provided to children with autism spectrum disorder as such skills affect individual's life in various aspects.

Nowadays, there are many approaches used in treating autism spectrum disorder. Among these programs is Enhanced Milieu Teaching (EMT) which described as practices involving the arrangement of stimuli in the child's natural environment and manipulate them, and the application of Applied Behavior Analysis (ABA) with the aim of creating an environment that encourages them to engage in the target behavior. Enhanced Milieu Teaching involves four strategies used by the teacher to encourage the child to reach a target behavior namely: modeling, mandatory model, accidental teaching and time-delay (Yoder. & Kaiser. 1991).

Teaching children with autism spectrum disorder communication skills and social interaction is essential to be prepared to learn the educational and rehabilitative skills to meet their needs, as autism spectrum disorder is defined behaviorally; so that its diagnosis and treatment depend on the behavior which the children show, and then the behavioral intervention and behavior modification are critical factors in any educational treatment program in the early stages of life (Barrie, 2010; Warren & Bambara.1989).

Fey and his colleagues (2013) have carried out a study which aimed to identify the impact of a program based on five communicative environmental teaching techniques (MCT) to improve and stimulate communication and the use of speech, where the sample included 64 children with mental and communicative retardation who were randomly selected, and were given sessions either once or five times per week and. The duration of the session was (60 minutes) and over nine months. Data were collected on a five-assessment scale prepared for the purposes of the study and which was used before, during and after treatment. The results indicated the presence of significant growth among the sample in communicative skills throughout the trial period, despite the sample's dropout.

Mancil, Conory & Haydonv (2008) has carried out a study that aimed at evaluating the effectiveness of the combination of environmental treatment and training on functional communication (FCT) and its effects on the behaviors of communicative functional skills on (3) male children in pre-school stage or children with disorder autism spectrum (ASD) aged within the primary school stage . Activities of the study were carried out in natural environments, and multi-design was used to evaluate the effectiveness of environmental improved therapeutic intervention. The results of the study showed that the negative behaviors have declined in conjunction with an increase in the overall percentage of communication, and such result has been generalized on communicative behaviors at home and in the classroom.

Brady & Bashinski (2008) have carried out a pilot study aimed to assess the effectiveness of intrusive program based on the effect of Enhanced Milieu Teaching strategies on increasing the pre-linguistic communicative skills of the deaf children with communicative needs, where one-to-one teaching approach was applied with a focus on PMT-A PMT, natural gestures and initial terms that are used to request. Study sample consisted of(9) children with deaf communicative needs. The results indicated the growth of their development database and an increase in the initial verbal skills used for the request, and evident increase and growth in the non-verbal communicative skills including gestures, signals and understand the eye looks and the evolution of adaptive skills, as these skills increased among all respondents.

Hancock & Kaiser (2002) have carried out a study aimed at identifying the effect of Enhanced Milieu Teaching on Social communication skills of children with autism in preschool when receiving intervention by the trainers. [Single-subject design](#) was applied on four children to assess the children' acquisition and use of the generalization of linguistic goals and social skills as a result of the intervention. The results of the study indicated that all children have shown a positive increase for the use of the language of target specific at the end of (24) sessions of intervention, and these results were maintained through follow-up observations after 6 months, and there was also an evidence of positive changes in the linguistic diversity of the children. Three out of four children showed the generalization of these positive effects of interactive language with their mothers at home, with a significant amount of changes observed immediately after the intervention, and the satisfaction of parents towards the intervention and the child's score was high.

Problem of the study:

The most critical results in autism spectrum disorder are those problems relating to communication and social interaction; therefore, children with autism spectrum disorder need specialists to have concern with these problems, also they need the care of their families' and those in charge attention to achieve the highest degree of psychological and social adjustment with the society around them. The current study comes to develop a training program based on Enhanced Milieu Teaching (EMT), which effectiveness was evidenced through several studies. Enhanced Milieu Teaching (EMT) is recently ranked among the practices which are based on the scientific evidence in the treatment of autism spectrum disorder. The researcher in this study has measured the effectiveness of this program in the improvement of social communication in line with the modern classification (DSM5) of autism spectrum disorder due to its impact on the mastery and adaptation in communicative, social and interactive skills. The current study tries to answer the following question:

- What is the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of children with autism spectrum disorder in Jordan?

Importance of study

The importance of the current study lies in identifying the importance of Enhanced Milieu Teaching (EMT) in improving social communication skills of children with autism spectrum disorder in Jordan. The theoretical and practical importance of the current study lies in the following:

- Provide the theoretical literature in the field of special education in Jordan, and specifically in the field of autism with the basic skills necessary for social communication.
- Directing those in the field towards the quality of services provided to children with autism spectrum disorder, and introducing such services to them because of the importance of benefiting from the capabilities available to provide services and programs for them.
- The need of special education field for such research which is based on procedural interventions, due to the lack of direct studies on Enhanced Milieu Teaching (EMT) on children with autism spectrum disorder in Jordan and Arab World-as far as the researcher knows.
- An attempt to conclude the results of the effectiveness of strategies based on Applied Behavior Analysis in the Jordanian environment in an organized manner, to improve the mechanism and practice of these strategies.
- To supplement this field with the strategies and procedures of applied behavioral analysis, which effectiveness was indicated through the studies in developed societies?
- Guiding teachers and those working in this field towards the need to train children with autism spectrum disorder on the social communication skills because of its impact on their life.

Objectives of the study:

The objectives of the current study include the following:

- Building a training program based on (Enhanced Milieu Teaching Training) and building the study tool in social communication which can be utilized by researchers who are interested in providing services for people with autism spectrum disorder.
- Investigating the effectiveness of training program based on (Enhanced Milieu Teaching Training) in improving social communication skills of children aged (10-6) years with autism spectrum disorder in Jordan.

Limitations of the study:

The results of the current study limits by time during which and where the current study is carried out, and the possibility of generalizing the results of the current study is determined based on the similarity with the study's respondents and their circumstances, as well as methodology used in answering the question of the study.

Methodology and procedures:

Participants were selected randomly. The study sample consisted of (4) children with autism spectrum disorder within the age group (10-6) years, of those children in Irbid Academy for Autism and Special Education.

The researchers in this study have used the experimental approach to design ABA case study because it commensurate with the objective of the current study and the characteristics of the study sample.

Tools of the study:

The researcher has built children with autism spectrum disorder social communication skills scale by referring to the literature relevant to the subject of social and communication skills, and which consisted of (34) items distributed on the following dimensions: Verbal communication dimension consisting of (20) items, and non-verbal communication dimension consisting of (14) paragraph items. This scale is used by teachers in the classroom, where the teacher gives the child an evaluation on each statement by choosing one of the following evaluations:

- It always applies (5 scores) - It sometimes applies (4 scores)
- It often applies (3 scores)- It rarely applies (2 scores)
- It never applies (0 score).

In the preparation of this scale, the researchers have followed the following steps:

The researchers have reviewed the literature and the theoretical frameworks for measuring social communication skills of children with autism spectrum disorders for the following lists and references:

- Lists prepared by Sam. Goldstein , Jack. Naglier & Sally. Ozanoff. 2009, Assessment of Autism Spectrum Disorder.
- Lists prepared by Leach. Debra, 2012, Brining ABA to home, School and play for young children with Autism Spectrum Disorders and other Disabilities.
- Lists prepared by Kari Duna. Burom, & Pamela, Wolfberg, 2008, Learner on the Autism Spectrum Preparing highly qualified Education.

Psychometric properties (validity and reliability) of the scale have been confirmed through the following steps:

First: Validity of study tool: the researcher has submitted the study tool for verifying its validity to (10) specialists working as faculty members in Jordanian universities and special education specialists in order to verify its formula , its accuracy and its suitability for the purpose for which it was designed.

Second: [structural validity of study tool](#) : [structural validity of study tool](#) was verified through the calculation of Pearson correlation coefficient. Table no. (1) Shows the results.

Table 1: Pearson correlation coefficient

Verbal communication				Non- verbal communication			
Item no.	correlation coefficient	Item no.	correlation coefficient	Item no.	correlation coefficient	Item no.	correlation coefficient
1	**0.51	11	0.23	21	0.28	28	*0.45
2	*0.48	12	**0.42	22	**0.52	29	**0.57
3	**0.59	13	**0.42	23	*0.34	30	0.24
4	**0.56	14	**0.51	24	**0.50	31	*0.33
5	*0.38	15	0.29	25	*0.32	32	*0.32
6	*0.43	16	*0.39	26	*0.42	33	*0.52
7	*0.42	17	*0.33	27	*0.39	34	*0.44
8	*0.41	18	*0.35				
9	**0.55	19	*0.49				
10	*0.32	20	**0.57				

** Statistically significant at **.(0.01)** * Statistically significant at **(0.05)**

Table (1) shows that item's correlation coefficients with the total score of Verbal communication dimension ranged between (0.23 and 0.59) and for Non- verbal communication ranged between (0.24 and 0.57), which are considered statistically significant at the significance levels (**0.01**) and (**0.05**). These significances are acceptable for the objectives of the current study and indicates the structural validity of social communication skills scale.

Third: validity of study tool

(Test- Re Test) approach was used for calculating reliability of the study tool through the use and reuse of the tool after a time interval of two weeks between the first and the second application and applied on the study population consisting of (3) children who were later excluded from the study sample . Reliability coefficient – using (Test- Re Test) approach for Verbal communication dimension was (0.73), and for Non- verbal communication was (0.69). The total score of social communication skills scale was (**0.74**). These values are acceptable for the objectives of the current study. Table (2) shows the values of (Test- Re Test) Reliability coefficient for the dimensions of social communication skills scale.

Table 2: Reliability coefficient values for the dimensions of social communication skills scale.

Dimension	No. of items	(Re Test) Reliability coefficient
Verbal communication	20	0.73
Non- verbal communication	14	0.69
Total score of communication scale	34	0.74

Second: training on Enhanced Milieu Teaching program

Among the learning approaches based on the modern strategies of Applied Behaviour Analysis that have been used with children with autism spectrum disorder is training on Enhanced Milieu Teaching where training program based on Enhanced Milieu Teaching based on the revision of literature related to Enhanced Milieu Teaching used with children with autism spectrum disorder(Hancock & Kaiser, 2002), (Patrica& Rebecca, 2012). The researcher has followed in this program set of modern Applied Behaviour Analysis Strategies such as modeling , mandatory model, accidental teaching and time-delay.

Program content: This proposed program is based on a set of actions as follows:

Procedures before sessions represented by preparation: be at the beginning this is applied at the beginning of training session which takes about (5) minutes at the beginning of the training session and which is primarily focuses on the arrangement of natural environment surrounding the student for a training, and the prevention of behavioural problems and sitting on the training table.

Actual actions of sessions: which takes about (20) minutes from the time of the training session, in order to start the application of the training session through the strategies proposed for the development of student's skills and to encourage the child to reach the targeted behaviour.

Final procedures of the session: which takes about (10) minutes of the training session, which aim to assess the extent to which the student has the target skill through the evaluation of the activities which the teacher asks the student to implement in the end of the session.

The program sessions: The program consists of (36) educational session, where the student will be trained on (12) basic skills, by (3) weekly sessions for each skill.

Program objectives: The overall objective of the program is to improve social communication skills among a sample of children with autism spectrum disorder in Jordan, which is divided by a set of specific objectives as follows:

- Development of verbal communication skills of children with autism spectrum disorder participating in the study.
- Improvement of the ability of children participating in the study to respond and initiative in non-verbal communication methods.

Targeted skills: Skills targeted in the program to achieve these objectives are as follows: (1) Learning verbal demand. (2) Learn how to wear clothes. (3) Learn to greet.(4) Asking permission. (5) Learn how to play ball. (6) Put food in a dish. (7) Learn drawing on the board. (8) Learn how to play with dolls. (9) Learn how to ask for help. (10) Learn naming members of the family (father and mother). (11) Learn how to cross street. (12) Distinguish animal sounds interactively.

In order to answer question of the study, the researchers have used the following statistical treatments:

- Path Analysis per case, (pre-test and post-test on the same respondent).
- Pearson correlation coefficient of correlation to verify the structural validity.
- The use of (Test- Re Test) to verify the reliability coefficient.

Results:

First: results of the first question:

- 1- What is the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of children with autism spectrum disorder?

In order to answer this question Path Analysis was applied on the children' responses on Social Communication Scale among children with autism spectrum disorder. Path Analysis of total score of respondents on social communication skills of pre-test and post-test, where the results shows that respondents' scores on the first scale of social communication skills for the pre-test of verbal communication dimension were (52) , (40) for non-verbal communication dimension, and(92) for the total score of social communication. The result of the post-test of verbal communication dimension was (68),and for non-verbal communication dimension was (50),and the total score of social communication was (118).These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of respondents where all scores of post-test were higher than the scores of pre-test on the first scale.

The results have also showed that the scores of respondents on the second scale of social communication skills were as follows: (50) for the pre-test of verbal communication dimension,(36)for non-verbal communication dimension ,and as for the total score of communication skills the score was (86).As for the post-test of verbal communication dimension the score was (70),and (51) for non-verbal communication dimension. As for the total score of social communication the score was (121).

These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of respondents where all scores of post-test were higher than the scores of pre-test on the second scale.

Path Analysis of the first respondent on social communication skills for pre-test and post-test. The results have shown the following: the score was (51) on the first scale of social communication dimension for the pre-test of verbal communication dimension, (34) for non- verbal communication dimension, and (85) for total score of social communication. The score of post-test of verbal communication dimension was (70), and (67) for non-verbal communication dimension, and (123) for the total score of social communication. These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of respondents where all scores of post-test were higher than the scores of pre-test on the first scale.

The results have shown the following: the score was (41) on the first scale of social communication dimension for the pre-test of verbal communication dimension, (34) for non- verbal communication dimension, and (75) for total score of social communication. The score of post-test of verbal communication dimension was (67) , and (46) for non-verbal communication dimension, and (113) for the total score of social communication.

These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of respondents where all scores of post-test were higher than the scores of pre-test on the second scale.

Path Analysis of the second respondent on social communication skills for pre-test and post-test. The results have shown the following: the score was (48) on the first scale of social communication dimension for the pre-test of verbal communication dimension, (39) for non- verbal communication dimension, and (87) for total score of social communication. The score of post-test of verbal communication dimension was (61), and (47) for non-verbal communication dimension, and (108) for the total score of social communication. These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of the second where all scores of post-test were higher than the scores of pre-test on the first scale.

The results have shown the following: the score was (51) on the second scale of social communication dimension for the pre-test of verbal communication dimension, (37) for non- verbal communication dimension, and (88) for total score of social communication. The score of post-test of verbal communication dimension was (68), and (47) for non-verbal communication dimension, and (115) for the total score of social communication.

These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of the second respondent where all scores of post-test were higher than the scores of pre-test on the second scale. Path Analysis of the third respondent on social communication skills for pre-test and post-test for first and second scales. The results have shown the following: the score was (53) on the first scale of social communication dimension for the pre-test of verbal communication dimension, (35) for non-verbal communication dimension, and (88) for total score of social communication. The score of post-test of verbal communication dimension was (68), and (47) for non-verbal communication dimension, and (115) for the total score of social communication. These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of the third respondent where all scores of post-test were higher than the scores of pre-test on the first scale.

The results of the third respondent on the second scale of social communication skills were as follows: (45) on the second scale of social communication dimension for the pre-test of verbal communication dimension, (35) for non-verbal communication dimension, and (80) for total score of social communication. The score of post-test of verbal communication dimension was (71), and (57) for non-verbal communication dimension, and (128) for the total score of social communication. These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of the third respondent where all scores of post-test were higher than the scores of pre-test on the second scale.

Path Analysis of the fourth respondent on social communication skills for pre-test and post-test for first and second scales. The results have shown the following: the score was (46) on the first scale of social communication dimension for the pre-test of verbal communication dimension, (32) for non-verbal communication dimension, and (78) for total score of social communication. The score of post-test of verbal communication dimension was (72), and (52) for non-verbal communication dimension, and (124) for the total score of social communication. These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of the fourth respondent where all scores of post-test were higher than the scores of pre-test on the second scale.

The results on the second scale have shown the following: the score was (63) on the second scale of social communication dimension for the pre-test of verbal communication dimension, (47) for non-verbal communication dimension, and (110) for total score of social communication. The score of post-test of verbal communication dimension was (73), and (50) for non-verbal communication dimension, and (123) for the total score of social communication. These results show the effectiveness of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of the fourth respondent where all scores of post-test were higher than the scores of pre-test on the second scale except the non-verbal communication whereas there was a little difference between the pre-test and post-test.

Discussion of the results of study:

Results of the study showed that there was a marked improvement in the average scores of all respondents on social communication scale, as well as for each sub-dimension of the following (verbal communication, non-verbal communication) depending on their performance on the items of the scale and in favor of the post-test.

The results have also indicated that there was a marked improvement in the average of total score for first, second and third child on social communication scale, as well as for each of the following sub-dimensions of the scale (verbal communication, non-verbal communication) depending on their performance on the items of the scale and in favor of the post-test.

This may be due to the effectiveness of the proposed program as the program focused on the increase and improvement in the respondents' social communication skills, providing them with appropriate and desirable reinforcements for the emergence of communicative responses, for example, it has focused on visual communication responses, signals, gestures and facial expressions as well as a short interviews and greet others. The effectiveness of the program can be explained through its focus on communicative skills and encouraging the child to communicate through constant reinforcement; also effectiveness of the program can be explained through its nature which is based on the environmental arrangement of natural life and it is dependence on applied behavior analysis strategies that have been proved its effective with children with autism spectrum disorder.

The reason beyond the significant improvement among these children can be explained by the development of children's attention skills where attention skills are considered as a previous and necessary requirement for modeling, which is a one of program's strategies used in the development of children 'communicative skills.

The results also as can be attributed to the presence of children in booster environment that attracts their attention, capture their attention, and enables them to acquire the skills of reception and response, and thus acquire the skills to communicate with others, whether in a verbal or non-verbal form.

If children with autism spectrum disorder are exposed to a specialized program to improve social communication skills, supported by measures to modify the behavior and adjust the environment, and increase the chances of communication between adults and children, this leads to a significant progress in social communication skills, and this result agreed with the results of Brady and Bashinski (2008).

The results also indicated that there is a disparity in the improvement of the average total score of the fourth child on the social communication scale as well as for each dimension of the sub-dimensions of the scale (verbal communication, non-verbal communication), depending on their performance on the items of the scale and in favor of the post-test. As for the fourth child, the percentage of the improvement of the total score between the first and second scale was as follows: (%46-%13), for verbal communication (%26-%10), and (%3-%20) for non-verbal communication. The disparity of the improvement of the fourth child can be attributed to its disorder level; whereas the most prominent characteristic of children with autism spectrum disorder is a qualitative deficiency in social communication skills.

Recommendations:

In light of the results of the current study, the researchers recommend the following:

- The application of Enhanced Milieu Teaching (EMT) in the improvement of social communication skills of children with autism spectrum disorder and such children are to be trained in early age.
- Carrying out studies in order to verify the effectiveness of Enhanced Milieu Teaching (EMT) in the development of other developmental manifestations among children with autism spectrum disorder such as self-care skills.
- Carrying out studies on more severe cases and other disabilities using Enhanced Milieu Teaching (EMT).

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