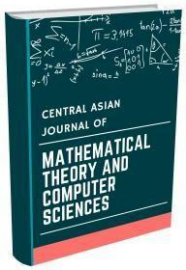

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Article

Evaluation of a Joint Attention Training Program with The Purpose of Improving Autistic Children's Emotional Literacy

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Abstract: The present study sought to evaluate the efficacy of a joint attention training program in enhancing emotional comprehension among autistic children by comparing the pre-test emotional understanding between the experimental and control groups. As well as the difference in understanding emotions between the pre-test and the post-test for the control group in autistic children. The research also aims to identify the difference in understanding emotions between the experimental and control groups in the post-test in autistic children. To achieve the research objectives, the researcher randomly selected (32(children from an institute for the care of autistic children, where they were randomly distributed into two experimental and control groups. The researcher developed a training program based on theories of joint attention, including seven tactics, and presented it to arbitrators specialising in educational psychology and special education, together with the theoretical framework and used instruments. To assess the efficacy of the training program in enhancing emotional comprehension, the researcher devised a mock exam to evaluate the knowledge of emotions in autistic children, initially including 27 paragraphs with two possibilities each. The study concluded that there are no statistically significant differences between the control and experimental groups in understanding feelings at the pre-test. Likewise, there are no statistically significant differences between the pre-test and post-test of the control group in understanding feelings. The most important result is that there are statistically significant differences between the pre-test and post-test of the experimental group in favor of the post-test in understanding feelings, and there are also statistically significant differences between the control and experimental groups in understanding feelings at the post-test in favor of the experimental group.

Keywords: Joint Attention, Training Program, Improving Autistic, Emotional, Literacy

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1. Introduction

The term autism is derived from the Greek word (autos), which means self. Autism wasn't recognised as a unique condition until the mid-twentieth century. In 1943, Leo Kanner, a psychiatrist at Johns Hopkins University, documented the challenges of 11 of his patients. Kanner observed that his patients had similar traits, but the pattern of challenges differed from case to case. However, he recognised social withdrawal as a key trait and dubbed it early childhood autism [1].

He defined "autistic loneliness" in his patients as an inability to connect to people and circumstances, and he included this quality into his descriptions of present autism. Hans Asperger, a paediatrician at the University Hospital of Vienna, noticed individuals who lacked empathy for others and engaged in one-sided interactions. His patients also

had significant social problems, and Asperger referred to them as "autistic psychopathy."[2].

In 1971, the first scientific publication specialising in autism debuted. It was once known as the Journal for Autism and Developmental Disorders. It is one of the best-known autism publications in the world. Scientists had no anticipation that the number of children with autism would rise to the level it has now. Autism awareness has increased, resulting in the discovery of more instances, which has been aided by the availability of additional diagnostic instruments [3].

There are several scientists who have contributed to the rapid scientific progress that has made autism the centre of attention in our current era, including Michael Rutter, who has made distinguished scientific contributions, the most important of which is the development of diagnostic measures for autism. Laura Wing, another scientist, was the first to propose that autism condition is characterised by a triple circle of deficiencies that include social deficits, communication deficits, and imagination. She pioneered the concept of the autism spectrum, which recognises different levels of autism [4].

This research is critical in elucidating the cognitive features and social behavioural manifestations that differentiate autistic children, particularly with joint attention and emotional comprehension, as joint attention is one of the important factors in children with autism disorder, which contributes to early intervention in an attempt to train children and develop their skills [5].

1.2 Problem statement

According to data on autism prevalence, one out of every 160 persons suffers with the illness. According to a research issued by the University of Cambridge's Research Centre, the incidence of autism disorder rose from (5) instances per (10) thousand children per year at the age of (5-11) to (75) cases per (10) thousand children. This is a high proportion for reasons that may be unknown. Meanwhile, experts at educational and psychological research centres in Iraq believe that there are seven to nine thousand children with autism registered in more than twenty centres around the nation [6].

As a result, we are dealing with a situation that is both dangerous and increasing steadily. Autism is an illness that manifests at a young age and is distinguished by a number of syndromes and behavioural abnormalities that have piqued the attention of psychologists, psychiatrists, paediatricians, neurologists, educators, and developmental and language problem experts. In addition to parents and families of children with autism, because of its evident influence on the family and society, and its odd and interesting symptoms, as well as its impact on the lives of autistic children and those around them [7].

1.3 Aim of the study

The current research aims to identify the following:

a. The difference in understanding emotions between the experimental and control groups in the pre-test in children with autism.
b. The difference in understanding emotions between the pre-test and the post-test for the control group in children with autism.
c. The difference in understanding emotions between the pre-test and the post-test for the experimental group in children with autism.
d. The difference in understanding emotions between the experimental and control groups in the post-test in children with autism.

1.4 Literature Review

Interactive video games, apps, and technologies that improve the social and emotional cognitive capacities of people with impairments, such Alzheimer's disease, Down syndrome, and others, have been the subject of extensive study. The efficacy of implementing early intervention programs that use assistive technology to comprehend and evaluate the emotional abilities of individuals with Down syndrome has been studied.

According to research, children with autism spectrum disorder (ASD) benefit greatly from social tales that include multimedia elements.

These stories assist the children understand and comprehend various social situations, as well as the feelings of those around them. Giving children with autism spectrum disorder social tales has a considerable effect on their behaviour, according to the research. In addition, one research found that children with ASD had more positive interactions with others after hearing social tales more often. Using interactive multimedia based social storytelling may help children with ASD learn acceptable social behaviour more quickly.

Additionally, studies have examined the efficacy of teaching children with ASD communication skills via the use of interactive songs, calming music, and visual symbols. Research has shown that children with autism spectrum disorder (ASD) are more likely to engage with and pay attention to visual cue information that features cartoon pictures rather than human images. This suggests that learning materials based on cartoons might be quite helpful for these children. To aid low-functioning ASD children's sensory skill development, many researchers have created real-time gesture tracking systems that concentrate on auditory cues. Children who were already used to their natural surroundings benefited greatly from the enhanced auditory-gesture connection.

The social abilities of autistic children may be greatly improved by using social tales that include augmented reality and 3D animations, according to research. In addition, a research looked at how autistic children may benefit from using IT gadgets to gain social skills as part of their behaviour treatment, and the findings were impressive. Aspects of social sensitivity (pragmatic) abilities, including humour comprehension and the use of metaphors in social communication, have also been the focus of research on individuals with ASD.

Understanding social and pragmatic inference was the primary focus of the study's investigation into the ways in which children with ASD make sense of challenging circumstances. A new interactive video game has been created to help youngsters with Down syndrome improve their intelligence, language skills, and cognitive abilities. Children accomplished better when playing this game, which was developed by simulating real-life situations with an emphasis on visual abilities and understanding.

On the other hand, there has been little investigation into developing an evaluation instrument to gauge the social and emotional intelligence of children on the autism spectrum. Consequently, we choose to use multimedia social tales to boost ASD children's emotional intelligence and develop a prototype instrument to evaluate their social and emotional cognitive abilities. During the music intervention, all participants' reactions increased significantly and were more engaged, according to this study.

1.4.1 Emotions Understanding

A significant portion of human communication relies on nonverbal methods, including movements, gestures, and postures that provide messages about persons' thoughts, emotions, and intentions. Articulating emotions in person. The movements shown on the face contribute significantly to this communication in conveying internal emotional states and mental states. In typical development, the ability to recognize emotions begins to appear early in childhood and through growth and improvement throughout adolescence and adulthood. Emotional recognition abilities typically begin with the six basic emotions (happiness, sadness, fear, anger, disgust, surprise) [8].

The ability to recognize these emotions is present in children as young as five to seven months old. By age 10, children are expected to be functioning at adult levels. Complex emotions (such as jealousy or guilt) differ from basic emotions in that they are usually more nuanced and more context-dependent. It usually involves a larger theory of the mind based on beliefs and decision-making. Because these feelings are more complex,

their processing matures considerably later and improves throughout adolescence and adulthood [9].

A prevailing assumption exists that children with autism lack the capacity for empathy and the ability to comprehend others' emotions. Although children with autism do not show their emotions in the usual ways that others do, accusing them of being emotionally incomprehensible and unable to understand them is completely wrong [10].

Autism is also associated with other emotional difficulties, such as recognizing another person's feelings. Although this trait is universally accepted as a symptom of autism, there is little scientific evidence to support this concept. The capacity to discern an individual's emotions from their facial expressions partially relies on the signals sent by the eyes and lips. Individuals with autism often refrain from making eye contact, which further exacerbates their challenges in recognising emotions [11].

1.4.2 Understanding Emotions and Autism Spectrum Disorders

In Kanner's description of autism, the requirement for emotional contact was considered an example of the genetics of autism disorders. More than 60 years later, the role of emotion in autism is still debated. The World Health Organization's (WHO) ICD-10 criteria and the American Psychiatric Association's (APA) DSM criteria for diagnosing autism include a list of marked impairments in the use of facial expressions, body postures, gestures, and the organization of Social interaction. The findings showed a lack of mutual sharing of emotions, weak or distorted emotional response to others, and an unwillingness to spontaneously share in enjoyment [12].

In these difficulties, the use, sharing, and response to emotions are nearly identical in two of the three components of emotion processing: producing an emotional state and regulating that state. It is widely believed that challenges in emotion recognition are prevalent among persons with autism spectrum condition, whereas normal children gain the ability to recognise facial expressions of emotions as an early social skill. Andrews discovered that 4-month-old newborns could differentiate between emotions of anger, fear, sorrow, pleasure, and surprise when shown in a familiar setting, and their reactions were unique to distinct emotional expressions [13].

Also, between 8 and 10 months, infants begin to use emotions for social signaling. Emotional expressions are a primary source of information about the sender's current emotional state and intentions and about objects and events in the environment. Failure to develop basic emotion recognition skills early on has serious consequences for the child and his or her social development [14]. The most important manifestations of difficulty in understanding feelings are:

a. Challenges in identifying and articulating emotions: This refers to the difficulty in both recognising emotions and conveying them via verbal and non-verbal ways.
b. Difficulty in differentiating between emotions and physical sensations: This refers to the challenge of discriminating between emotional sentiments and the physiological responses that accompany them
c. Challenges in identifying and addressing the emotions of others, including vocal intonation and facial cues.
d. Deficiency of imagination: This denotes superficial creativity, shallow cognition, and intellectual inflexibility.

2. Materials and Methods

The present study aimed to determine the efficacy of a joint attention training program in developing emotions in children with autism spectrum condition. The researcher used the experimental technique with a dual design (experimental group and control group), which differs from other methods in that it is not confined to documenting the present state of the event or phenomenon. However, it refers to a clear and purposeful intervention with the goal of modifying the reality of the phenomena or event by the use

of procedures or adjustments, followed by correct observation, analysis, and interpretation of the outcomes. The research sample is the autistic children at the Al-Nourain Institute for the Care of Autistic Children in the city of Diwaniyah, (32) boys and girls, see Table 1.

Table 1. Dividing the research sample by gender.

Gender	Groups	Number	Total	Ration
Males	Control group	10	22	72%
	Experiment group	12		
Females	Control group	6	10	28%
	Experiment group	4		
	Total	32	32	100%

3. Results and Discussion

3.1 The Training Program

The joint attention program aims to develop understanding of emotions in children with autism spectrum disorder. The program is based on non-verbal communication through simulation. The trainer asks the child to imitate the following hand movements: clapping, farewell, wheel movement, raising the hand up. The program is also based on receptive commands, whereby the trainer asks the child to execute the following commands: take-give me, stand-sit, go-come back. The program is also based social stories: A collection of illustrated stories that are read to the children and the trainer asks them to reread them. These are the stories of Cat story , the donkey and the story of the thief beaver.

The strategy comprises teaching the youngster to count from 1 to 10 with his fingers while also dividing attention between his fingers and the trainer's fingers. The youngster is also taught the names of the colours. This technique also involves three easy conversations between the trainer and the youngster, such as: (Here you go--Thank you). The trainer will ask the youngster to identify a certain object in a series of photographs with a variety of forms. The trainer also shows the youngster photos and asks him to repeat them, then hiding them and asking him how many items he observed and their names.

The equivalence of the two groups was taken into consideration through random distribution, then the differences in ages were calculated , and they were not statistically significant. The chi-square was calculated to test the gender difference in the sample for the two groups and whether it had a statistical effect, and the test proved that it was not statistically significant.

The current program consists of (32) sessions provided to children with autism spectrum disorder, at a rate of (4) sessions per week, and the duration of each session reaches (15) minutes for each child in an individual manner. The researcher applied it in the period between Monday 15/04/2024 and Friday 30/05/2024, for a period of seven weeks. To achieve the objectives of the current research, it was essential to develop a test to assess the emotions of autistic children. The researcher reviewed the studies available to her that addressed the variable of understanding feelings. In constructing the research test, she utilised the contributions of Allen & Yen. Consequently, the researcher developed and articulated the concept of emotional comprehension, see Table 2.

Table 2. Emotional Understanding Test Domains.

No	Emotional Understanding Test Domains	Number of test items
1	Recognizing Emotions	4
2	Interpreting Emotions	8
3	Recognizing Desire-Based Emotions	6
4	Recognizing Belief-Based Emotions	5
5	Expressing Emotions	4

The researcher prepared the test in a preliminary form consisting of (25) paragraphs distributed over the fields, The paragraphs were formulated in the form of simple questions revolving around pictures that indicate specific feelings. The trainer (the person conducting the test) poses the test questions to the child after showing him the picture appropriate for the paragraph. Each case presents two possibilities for the response: the first assesses emotional comprehension, while the second does not evaluate it. Upon the researcher's identification of the test alternatives, the first option (true) is assigned a score of (2), while the second alternative (false) receives a score of (1).

3.2 Statistical Analysis of Paragraphs

The statistical analysis of test items is a fundamental stage in effective analysis construction. Adopting paragraphs that have good psychometric properties makes the test more valid and reliable. When the researcher chooses the appropriate paragraphs with good statistical properties, he controls the characteristics of the entire test and its ability to measure. Following the administration of the test to thirty-two boys and girls from the research sample, total scores were computed for each participant and for each section of the test to reflect the examinee's raw score. It is important to note that the scoring system ranges from one to two, resulting in a maximum attainable score of fifty-four and a minimum score of twenty-seven.

After applying the test to the sample members, numbering (32) boys and girls, and correcting the answer forms, and to extract the discriminating power of the test items, the scores of the sample members were arranged from the highest total score to the lowest total score, and the two extreme groups were determined by the total score and by a percentage of (27%(of each group, and the)t-test) was used for two independent samples to calculate the significance of the differences between the averages of the two groups in the scores of each paragraph of the test items, on the basis that the calculated t-value represents the discriminating power of the paragraph.

The researcher assessed the disparities between the upper and lower groups across the paragraphs, identifying five paragraphs as statistically insignificant, indicating a weak discriminative capacity between high-achieving children and those with low emotional comprehension. Consequently, the researcher excluded these paragraphs from the final version of the test.

3.3 Emotion understanding test descriptive statistics

One of the statistical indicators that any test should have is identifying the nature of the normal distribution, which can be identified by two basic indicators: the arithmetic mean and the standard deviation. The lower the standard deviation and the closer it is to zero, the more homogeneity or convergence there is between the values of the distribution degrees. Skewness and kurtosis are also characteristics of frequency distributions, as the skewness coefficient indicates the degree of concentration of frequencies at different values of the distribution, and the kurtosis coefficient indicates the degree of concentration of frequencies in a certain area of the normal distribution. Statistical indicators were extracted to test the understanding of feelings, for the sample data of the statistical analysis and the Table 3.

Table 3. Descriptive statistical indicators for the emotion understanding test.

No	Statistical indicators	Values
1	Arithmetic mean	32.13
2	Median	30,01
3	Mode	25,12
4	Standard Deviation	7.19
5	Variance	36.217
6	Skew	0.266

7	Kurtosis	-1.233
8	Range	19,06
9	Low Score	27,05
10	High Score	46,10

The figure 1 illustrates a line chart labeled "The normal distribution of the results," depicting fluctuations in data points across ten numerical values. However, the distribution does not exhibit the characteristics of a normal distribution, as evident from the sharp peaks and near-zero values. The presentation suggests potential anomalies or inconsistencies in the dataset.

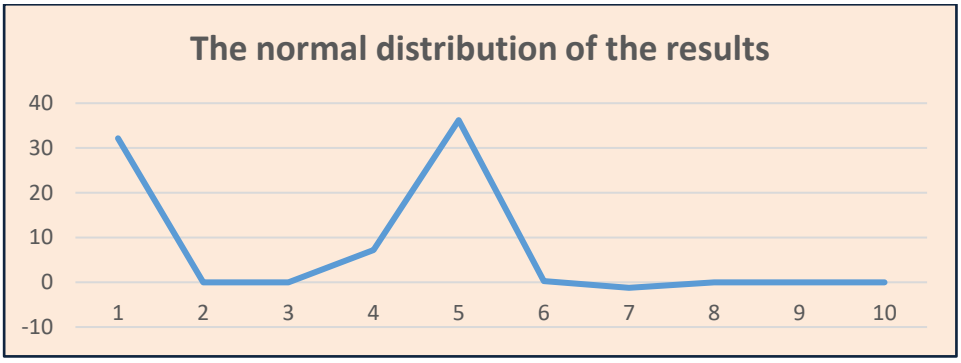

Figure 1. The normal distribution of the results.

The researcher set this goal in order to verify the homogeneity of the two groups (control and experimental) in understanding feelings before applying the training program. To achieve this, the researcher applied the feelings understanding test to both the control and experimental groups together, numbering (32) boys and girls. She extracted the arithmetic mean and standard deviation for each of them and used the t-test for two independent samples to find the significance of the statistical differences between the two groups. The Table 4 below:

Table 4. T-test results for the significance of differences between the experimental and control groups.

Groups	Sample group	Arithmetic Mean	Standard deviation	T-value	Significance
Control	16	27.64	3.98	0.22	Not significant
Experiment	16	27.26	4.43		

When comparing the calculated T values with the tabular T value, which is equal to 2.04, with a degree of freedom of 30 and a significance level of 0.05, we find that there are no significant differences that explain the difference between the two groups in terms of the arithmetic mean and standard deviation.

In order to verify the effect of traditional training programs that autistic children undergo in understanding feelings, the researcher conducted two tests, the first before applying the training program and the second after applying the training program. The pre- and post-tests provide us with information about the effect of the time factor and the effect of traditional training programs in understanding feelings. To verify this goal, the researcher applied the test to the members of the control group. The arithmetic mean of the pre-test was (28.65(with a standard deviation of (6.33). While the arithmetic mean of the post-test was (29.76 (with a standard deviation of (7.290) To extract the significance of

the differences between the two tests, the researcher used the t-test for two related samples because the same test was applied to the members of the same group twice, see Table 5.

Table 5. T-test results for the significance of differences between the pre- and post-test of the control group.

Groups		Sample group	Mean Difference	Standard deviation of variances	T-value	Significance
Control	before	16	1.07	3.66	1.14	Not
	After	16	1.07	3.66		significant

It is clear from the table above that the calculated t-value of (1.14) is smaller than the tabular t-value of (2.048) at a degree of freedom of (30) and a significance level of (0.05), which means that the differences between the two tests (pre- and post-test) are not statistically significant for the control group.

As for the difference in understanding emotions between the pre-test and post-test for the experimental group among autistic children, it was in the table below, see Table 6:

Table 6. T-test results for the significance of differences between the pre- and post-test of the experimental group.

Groups		Sample group	Mean Difference	Standard deviation of variances	T-value	Significance
Control	before	16	11.51	3.98	15.96	significant
	After	16	11.51	3.98		

It is clear from the above table (15) that the calculated t-value of (15.96) is greater than the tabular t-value of (2.048) at a degree of freedom of (30) and a significance level of (0.05), which means that the differences are statistically significant between the pre- and post-tests of the experimental group.

The difference in understanding feelings between the experimental and control groups in the post-test for autistic children. The researcher extracted the arithmetic mean and standard deviation for them according to the results of the post-test for understanding feelings. The arithmetic mean for the control group was (29.78 (with a standard deviation of (7.36(, while the arithmetic mean for the experimental group was (40.13) with a standard deviation of (7.017(. To find the significance of the statistical differences between the two groups, the researcher used the t-test for two independent samples, see Table 7.

Table 7. T-test results for differences in the post-test between the control and experimental groups.

Groups	Sample group	Arithmetic Mean	Standard deviation	T-value	Significance
Control	16	29.78	7.36	5.37	significant
Experiment	16	40.13	7.12		

It is clear that the calculated t-value of (5.37) is greater than the tabular t-value of (2.048) at a degree of freedom of (30) and a significance level of (0.05). The disparities between the two groups are statistically significant, favouring the experimental group, indicating that the program effectively enhances emotional awareness in children with autism spectrum condition.

4. Conclusion

Upon evaluating the findings of the recent study, it was determined that the suggested joint attention-based training approach is helpful in fostering emotional development in autistic children. This outcome may be elucidated by the notion that the foundation of "mind reading" is not a conceptual framework, but rather a kind of mental modelling (simulation). The imitator (the child subject to the training program) uses his mind as a model similar to the mind of the imitator (the trainer). Some theorists have proven that our simple theory of mind is the product of the practical practice of the skill of developing theories in a certain field. In general, as mind reading is based on the maturity of a mental organ, the simulation theory shows completely different aspects. According to the modified version of the simulation approach, mental concepts are not completely excluded from simulation. Simulation can be shown as a process that arises and manifests itself in a self-generated manner, in that the mental state is intended to match that of the imitated agent, and then we project it onto the target. In the end, mind reading plays a major role in human social understanding. Moreover, a pervasive prejudice exists suggesting that autistic children lack the capacity for empathy and the comprehension of others' emotions. Accusing someone of lacking emotions and the capacity for understanding, just because they do not express their sentiments in conventional ways, is fundamentally misguided. Maintaining such a notion will skew our view of them and impede the timely identification of appropriate therapy. Autism is also linked to other emotional challenges, such as recognising the emotions of others. While this characteristic is often recognised as a hallmark of autism spectrum condition, the capacity to discern an individual's emotions from their facial expressions is partially contingent upon the cues provided by the eyes and lips. Autistic individuals often avoid eye contact, which further complicates their ability to discern emotions. Accordingly, the researcher attributes the result reached by the current research (the effectiveness of the training program in developing the understanding of feelings) to the fact that its strategies are all based on developing joint attention skills in autistic children. Their understanding of feelings depends on their ability to pay attention to others, and thus developing these skills helps them understand the feelings of others easily. Based on the findings of this study, the researcher has determined that:

a. The ability of autistic children to respond to training is high if the training is done according to efficient programs.
b. Joint attention is one of the most prominent abilities that autistic children lack and its development contributes greatly to the development of many skills they have.
c. The ages of autistic children must be taken into account when preparing training programs aimed at developing their life skills.

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