Effect Of Training Program on Improving Mothers` Care Provided to Their Autistic Children

Amera Reda Zaki Elhayge[1], Amal Mohamed El-Dakhakhny[2], and Bataa Mahmoud[3]

[1] Clinical Instructor of Pediatric Nursing, Faculty of Nursing, Zagazig University, Egypt

[2] Professor of Pediatric Nursing, Faculty of Nursing, Zagazig University, Egypt

[3] Lecturer of Pediatric Nursing, Faculty of Nursing, Zagazig University, Egypt

Corresponding author: Amera Reda Zaki Elhayge, Email: ameraelhayge65@gmail.com

Abstract

Background: Autism is a neurodevelopmental impairment in communication, social interaction and unusual ways of perceiving and processing information can seriously hinder the daily functioning of autistic children. Parents are the voice for their children with ASD as well as themselves therefore, knowledge of the caregivers regarding the care of children with autism is highly important in rearing a child with autism. **The aim** of this study was to evaluate the effect of training program on improving mothers` care provided to their autistic children. **Design:** A quasi-experimental study design was carried out. **Setting**: Speech and Hearing clinic at AL Ahrar Hospital, College of Education of Disability and Rehabilitation at Zagazig University and Moasaset Ramze for Special Needs at Zagazig city. **Sample:** A convenience sample composed of 50 mothers and their autistic children who have been diagnosed with autism. **Tools:** Two tools were used to collect the study data: **I)** A structured interview questionnaire. **II)** The scale of mothers' care to deal with their autistic children. **Results:** The study results revealed highly statistically significant improvement mothers` reported practice regarding care of their autistic children throughout the study phases pre, post the intervention (P<0.001). **Conclusion:** The training program is effective in improving mothers` care regarding their autistic children. **Recommendation**: Encourage continuous sharing of the mothers during the care of their children with autism by specialists to know the child's needs, problems and to be aware of different methods of care.

Keywords: Effect, Training program, Mothers` care, Autism.

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Introduction:

Autism spectrum disorder (ASD) is a neurodevelopmental disorder marked by the existence of impairment in social communication and restricted, repetitive behaviors, which manifests within the early developmental period. Typically, autism is manifest by the time a child is three years of age and is life-long **(Ardiyani et al, 2020)**. There is variability in the pattern and severity of symptoms and in the timing of diagnosis. Even if the parents often notice that something is wrong during infancy it is very difficult to diagnose autism before the age of 3 years, this is because the behavioral symptoms used to establish the diagnosis have not clearly emerged developmentally until that age **(Yousef et al., 2016).**

Significantly, **Cheroni et al., (2020)** reported that more boys than girls are affected with autism by a ratio of approximately 4:1. Children with autism are found in all cultures and social and economic groups. Several lines of evidence indicate that genetic, environmental, and immunological factors may play a role in its pathogenesis.

In Egypt about 800,000 children with autism**,** about 1 in 68 children has been identified with ASD according to estimates from CDC. This increase is explained by improved diagnosis and public awareness. autism is four to five times more common among boys than

girls **(Omar, 2014)**. **Yousef et al., (2021)** stated that the prevalence of ASD in Sharkia Governorate was 5.4/1000.

Sultana et al., (2021) reported that ASD usually manifest deficits across three major behavioral components, namely (I) social interactions and communicative skills, (II) restricted interest spectrum (rigid routines or rituals, specific food and clothing preferences, and difficulty coping with the environment), and (III) stereotyped and repetitive behaviors (repetitive movement with object, recitative body movements such as rocking and hand-flapping). **Khudhair & Jassim., (2018**) stated that social activities of children with (ASD) are restricted, although some ASD children are arguably able to lead independent and fulfilling lives. In general, life-long care and a supportive environment are needed for the majority of ASD.

Parenting a child with autism can be a hugely rewarding experience Parents need to be considered as active participants of any intervention program, working closely with health and educational professionals. Parents have unique knowledge and experience of their own child and, if better equipped and supported, in their ability to help their child and advocate for their child's needs **(Prata et al., 2018**). Further, parents are usually the primary caregivers for their children and will accompany them into adolescence and adulthood. Parent training should therefore be a part of any intervention program and has proved to benefit both parents and their children **(Matsumura et al., 2022).**

Parents are the primary caregiver, thus playing a critical role in teaching and managing problem behavior exhibited by individuals with autism and other disabilities. This can help reduce the cost of therapy and promote generalization as well as a potentially high level of reinforcement for parents when implementing programs that result in positive behavior change. The benefits of parent training have been acknowledged as an essential component of successful interventions for children with an autism diagnosis **(Booth et al., 2018)**.

Bringing up a child with autism can be challenging for parents, especially when other people do not understand the issues. The knowledge of the caregivers regarding the care of children with autism is highly important in rearing a child with autism. Taking care of a sick child and their upbringing requires patience, perseverance and entrepreneurship in obtaining the help of specialists and skills to cope with difficult situations. The involvement and dedication of parents in the hardship of caring for an autistic child and the atmosphere in the family affect the functioning of the child **(Garg, 2018).**

Nurses are responsible for educating children with autism spectrum disorder and their families on various aspects and keeping them up to date, various teaching strategies are used to enhance knowledge, such as teaching, demonstration, discussion and self-education, these methods. Nurses who are appropriately equipped with knowledge about ASD, how to deal with children with ASD will feel more at ease and improve their capacity to interact with and care for people with ASD **(Hayat et al., 2019).**

Significance of the study

Autistic disorder is a lifelong disability and most children affected with this condition remains unable to live independently and require family and community support or institutionalizations. The overall impact of having a child with ASD on a family can create severe psychological stress from the initial diagnosis to the ongoing, day-to-day demand of caretaker responsibilities. Sufficient support for mothers may prevent or ameliorate these problems and they might indirectly achieve better outcomes. Therefore, implementing an educational program for mothers will be helpful in the acquisition of knowledge and practices regarding the disease and mothers' care of children. So, this study will be conducted to evaluate the effect of training program on improving mothers` care provided to their autistic children.

Aim of the study

The aim of the current study was to evaluate the effect of training program on improving care of mothers provided to their autistic children.

This aim was fulfilled through the following objectives to:

1. Assess mothers' knowledge regarding care of their children with autism.
2. Develop and implement a training program according to mother`s needs to improve the mothers` practice
3. Evaluate the effect of training program on improving mothers` care provided for their autistic children.

Research Hypothesis:

Mothers` care provided for autistic children will be improved after implementation of training program.

Subjects and Methods

Research design

A quasi-experimental study was carried out to complete this study.

Study setting

The study was conducted at three settings: Speech and Hearing clinic at AL Ahrar Hospital, College of Education of Disability and Rehabilitation at Zagazig University and Moasaset Ramze for Special Needs at Zagazig city.

Study Subjects

This study was carried out on a convenience sample composed of 50 mothers and their autistic children who have been diagnosed with autism at the previously mentioned settings, who fulfilled the following inclusion criteria*:*

- Children age 3-6 years
- Both sexes
- Free from any chronic diseases and congenital anomalies.
- All accessible mothers of autistic children who attended the previous settings.
- Mothers` voluntary participation and not attending any other training program.

The sample size was calculated using EPI Info software program version 6.04 with study power 80% and at confidence level 95%.

Tools of data collection*:*

Tool I- A structured interview questionnaire was developed by the researcher which is consisted of three parts:

- **Part (I):** Personal characteristics of children including age, gender, birth order, number of his\her sibling, degree and onset of the disorder as well as the family history of autism.
- **Part (II):** Child medical history including onset, manifestations, complications and treatment as well as behavioral problems.
- **Part (III):** Personal characteristics of mothers including age, level of education, occupation, marital status, income and number of family members and residence.

Tool II- The scale of mothers' care to deal with their autistic children

The scale developed by **Alwakeel et al., (2013)** to evaluate mother`s skills, used to deal with their autistic children. The scale consists of 147 items and distributed across 4 subscales as follows: Social interaction skills (20 items), Communication skills (54 items), Basic needs of satisfaction skills (44 items) and skills to deal with distruptive behaviors (42 items).

Scoring system:

Each correct answer was scored 1 point and zero for wrong one. According to the answers obtained from mothers, a scoring system was followed. The total score for the questionnaire was 147 points classified as following: Communication skills (41 items), Social interaction skills (20 items), Basic needs of satisfaction skills (44 items), Skills to deal with distruptive behaviors (42 items). The studied mother's answers were checked using a model key answer. **The total practice score was classified as follow:**

- Satisfactory <60 %
- Unsatisfactory >60%

Program development

The training program was partially constructed for the assessment of studied mothers' knowledge. The assessment was performed before the implementation of training program by interviewing each mother individually to assess their knowledge by using **tool I & tool II** after explaining the aim of the

study and had their approval to participate in the study. The content was divided into two main parts. The first part included education about autism spectrum disorder (definition, sign & symptoms, treatment and complication), the second part was about skills needed for improving mothers` care provided to their autistic children. Eight sessions were given in the program, two days per week. Sessions were explained in simple Arabic language that suits the studied mothers. Motivation and reinforcement during each session were used in order to enhance learning. After implementation of the program the studied children were reassessed (posttest) using the same pre format.

Content validity and reliability

For validity assurance purposes, the tools were tested for content validity by the three authors, the final form was ready for use. Reliability of tools was done for knowledge questionnaire and good consistency was found with Cronbach's Alpha 0.75 also good consistency was determined for mothers` care scale was 0.91 by using Cronbach's Alpha test reliability coefficient to measure the internal consistency for the final scale.

Statistical design

All data were collected, tabulated and statistically analyzed using SPSS 20.0 for windows (SPSS Inc., Chicago, IL, USA 2011)). Quantitative data were expressed as the mean ± SD, median (range) and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Mc nemar test or marginal homogeneity was used to compare between two dependent groups of categorical data. Wilcoxon signed ranks test was used to compare between two dependent groups of non-normally distributed variables. Percent of categorical variables were compared using Chi-square test or Fisher's exact test when appropriate. Spearman correlation coefficient was calculated to assess relationship between study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. Multiple linear regression (step-wise) was also used to predict factors which affect total knowledge and practice level. Cronbach alpha coefficient was calculated to assess the reliability of the scales through their internal consistency. P-value < 0.05 was considered statistically significant, p-value < 0.01 was considered highly statistically significant, and p-value ≥ 0.05 was considered statistically non-significant.

Results:

Table (1) showed personal characteristics of studied children, 62% of studied children aged more than 4 years old, with mean±SD of 4.62±1.00 years. Also, 84 % of the studied children were males compared to 16 % were female. Regarding to anthropometric measurement, it was found that normal measurement in relation to normal values of their peer's weight 62 %, height 70 %, and head circumference 98%. In addition, the same table showed that 42 % of them were the second regarding child ranking in the family and 78 % of the studied children have no education.

Table (2) clarified, medical history and disease characteristics of studied children. It was found that 82% of studied children were diagnosed with autism from 2-4 year of age and 92% of autistic children have moderate degree of autism, 64 % of autistic children had duration less than one year. The most common signs and symptoms of autism, studied children had, not seen in the eye of speaker, spend less time with others, showing less interest in composition of friendships with others, have repetitive movements, doesn't like to embrace one 94 %, 70 %, 66 % and 62% respectively.

Table (3) showed characteristics of family of the studied autistic children. It was found that 78% & 68% of autistic children lived in nuclear family and from rural areas respectively. As well as 74% of the families had insufficient income. Regarding to consanguinity, it was found that 76% of parents had no consanguinity relationship between parents. Whereas, 80% of the families had no history of autism. The same table showed that 54% of families of studied children has two children.

Table (4) pointed to characteristics of mothers of studied children were portrayed in table (5). It was found that 64% of mothers with autistic children at age group ≤35year with a mean of 34.22±6.19 years and 94% of mothers were married. Regarding to mothers' education

it was found that 60% had middle education. Also, 84% of mothers were housewives. As regard to mother's history during pregnancy, 74% of mothers were not nervous during pregnancy and 76% of them had caesarian labor. While, 48% of mothers had no problems during pregnancy.

Table (5), (6) clarified knowledge of studied mothers regarding definition, factors affecting autism, signs and symptoms, methods of treatment and problems of autism throughout the program phases. There was a marked enhancement in mothers' knowledge at post implementation of educational program with highly statistically significant difference (P<.000).

Figure (1) showed total scores of domains of the mothers` knowledge about autism throughout study phases. It was found that a marked enhancement in mothers` knowledge about definition of autism, factors that lead to autism, signs and symptoms of autism, methods of treatment for autistic children and problems of autistic child at post implementation of program with highly statistically significant difference (P<0.001) throughout program phases.

Figure (2) portrayed that 96.0% of studied mothers had unsatisfactory knowledge score pre implementation program and this percentage decreased to 16.0% after program implementation. While 4.0% only of studied mothers had satisfactory knowledge score preprogram implementation which increased to 84.0% after program implementation. The result was statistically highly significant (p<0.001).

Figure (3) clarified total scores of reported domains of practice of mothers of autistic children regarding care throughout program phases. It was found that a marked enhancement in mothers` reported practice as eye contact, social interaction skills, basic needs of satisfaction skills and skills to deal with distruptive behaviors throughout program phases at post implementation of program with highly statistically significant difference (P<.0001) throughout program phases.

Figure (4) portrayed, highly significant difference between total practice of mothers regarding care of autistic children at pre- and post- program, where (p<0.001). As evidence, 90.0% of mothers of children had unsatisfactory practice score pre-implementation of program which decreased to 6.0% after program implementation. While 10.0% only of studied mothers had satisfactory practice score preprogram implementation which increased to 94.0% after program implementation.

Relation between total satisfactory mothers` knowledge of studied autistic children and their family characteristics throughout program illustrated in **table (7).** It was found that highly statistically significant relation was found between total satisfactory mothers` knowledge of studied autistic children and number of children in family at pre- and post- intervention (P<0.001)

Table (8) illustrated relation between total satisfactory mothers` practice level and mothers` characteristics throughout program. It was found that there was highly statistically significant relation at post intervention between total satisfactory mothers` practice level and mothers` characteristics as age, level of education and job of mother (P= < 0.001).

Relation between total satisfactory mothers` practice level and their family characteristics throughout program illustrated in **table (9)**. There was no statistically significant relation between total satisfactory mothers` practice level and their family characteristics at pre and post intervention (P= > 0.05) but, there was highly statistically significant relation between total satisfactory mothers` practice and number of children in family at pre and post intervention of the program (P= < 0.001).

Table (10) revealed correlation between total score of knowledge and practice of studied mothers through program. It was found that highly significant positive correlation between total score of knowledge and practice of studied mothers (P= < 0.05), it was found that statistically significant correlation between total score of knowledge and practice of studied mothers at post intervention.

Discussion:

Autism spectrum disorder (ASD) is a neurodevelopmental disorder, manifested either in social communication and interaction deficits,

or in restrictive and repetitive patterns of behavior, interest or activities. The broad characteristic often depicted in failure to initiate or respond to social interactions, lack of facial expressions, abnormal eye contact and body language **(Zulkifly et al., 2021).**

The provision of parent training program can be useful for increasing knowledge and insight about the child, enabling the incorporation of therapy into the child's own environment and facilitating generalization of the skills learned. Parents are also involved as active participants of any intervention program **(Ardiyani et al., 2020)**.

Concerning mothers` reported practice, The present study concluded that majority of mothers of children had unsatisfactory practice score toward care provided to their autistic children before implementation of the program. Meanwhile, after implementation of the program, the majority of mothers had a satisfactory practice score toward care provided to their autistic children. This could be attributed to lack of mothers` knowledge due to not attending any training program about autism, and the mother don`t to seek more information about the care of autistic children, as well as, the mothers' poor awareness can be interpreted in general ways of behavior modification because their children with had a lot of unwanted behaviors.

Regarding the reported practice of mothers of children regarding eye contact throughout program phases. The current study revealed that there was a marked improvement in mothers` reported practice towards eye contact with their autistic children at post implementation of program with highly statistically significant difference at ($p<0.001$) throughout program phases. Before the intervention, majority of mothers had un satisfactory practice score regarding eye contact. It may be due to their inadequate awareness about correct eye contact with their autistic children and ways used to improve their children eye contact. After the intervention, majority of the included mothers had a satisfactory practice score regarding eye contact. That supported the effect of the educational training program on improving mothers` care provided to their autistic children.

Similar results were also reported by **Alkinj et al., (2022)** in a study conducted in Jordan entitled "**The effects of an educational program based on modeling and social stories on improvements in the social skills of students with autism"** showed that all participants in the experimental group achieved substantial improvement in eye contact compared to the monitoring group on the post-test.

Concerning reported practice of mothers of autistic children regarding social interaction throughout program phases. It was found that a marked improvement in mothers` reported practice towards social interaction with their children at post implementation of program with highly statistically significant difference at ($p<0.001$) throughout program phases. Before the intervention, majority of mothers had un satisfactory practice score regarding social interaction skills. It may be due to inadequate mothers` knowledge about how to deal with their autistic children and how to correctly and successfully involving children to interact with mothers and other children. After the intervention, majority of the included mothers had a satisfactory practice score regarding social interaction skills due to effect of intervention techniques such as working with social stories, play which turn out to be very useful when modifying social behaviors.

These findings agreed with **Wong & Kwan, (2010)** in a study about "**Randomized controlled trial for early intervention for autism: a pilot study of the Autism 1-2-3. Project"**, who found that there was a statistically significant improvement in the knowledge of the parent regarding the care provided to autistic children related to social skills and communication outcomes after the training intervention for parents. On the other hand, these results were in disagreement with **Carter et al., (2011)** who conducted a study entitled **"A randomized controlled trial of Hanen's "more than words" in toddlers with early autism symptoms"** and reported no main effect of the parent intervention program on changes of the knowledge of the parent regarding the care provided to autistic children regarding communication outcomes.

Concerning reported practice of mothers of autistic children regarding children basic needs of satisfaction throughout program phases. It was found that a marked improvement in mothers` reported practice towards basic needs of satisfaction of children at post implementation of program with highly statistically significant difference at ($p<0.001$) throughout program phases. Before the intervention, majority of mothers had un satisfactory practice score regarding skills of improving basic needs of satisfaction of children such as their nutrition, need for a quit sleep and need to adjust output processes. It may be due to inadequate mothers` awareness and knowledge about how to satisfy their children needs correctly. In addition, the mothers may be occupied by her responsibilities in their homes and with their other children and didn't have time to read about the disease. After the intervention, majority of the included mothers had a satisfactory practice score regarding satisfaction of children basic needs.

Parents' education has a great role for children's care and regarding particularly for nutrition it enables them selecting the proper food, and provides the right nutritional needs for childhood. The pre-testing phase of the study revealed that few mothers had basic knowledge about nutritional needs of autistic children which turned out to be a good success of nutrition education program introduced in this study. This may be due to the parents' ignorance or that the children are picky eater, forcing the parents to feed their children junk food. Whereby, majority of the mothers were found to have basic nutritional knowledge at post-testing phase.

Shohaimi et al., (2021) in a recent study about **"Knowledge of Special Nutrition for Children with Autism Spectrum Disorder Among Parents and Special Educators in Malaysia** ", showed that there was a low level of knowledge about the nutrition of children with ASD and conclude that majority of parents and special educators of children with ASD have limited knowledge and awareness about nutrition and diet of children with ASD. Moreover, **Yaseen et al., (2020)** conducted a study about "**Determination of knowledge of caregivers about dietary practices of autistic children.**" In – Pakistan, revealed that the pre-testing and post-testing phase of the study revealed significant improvement in basic knowledge about nutritional needs of autistic children and practice.

Behavioral sleep problems in children with autism spectrum disorder (ASD) are common and burdensome for both the child and their family **(Malow et al., 2014).** The results of the present study revealed that there was increasing in mothers` reported practice towards their children need for quit sleep at post implementation of program with highly statistically significant difference at ($p<0.001$) throughout program phases. These findings are in accordance with **Roberts et al., (2019)** in a study about **Comparison of Online and Face-to-Face Parent Education for Children with Autism and Sleep Problems",** showed improvements in parents' ratings of children's bedtime resistance, sleep onset delays, bedtime anxiety, reported improvement in child sleep behaviors.

Similarly, **Johnson & Malow, (2019)** who study **"Parent training for autism spectrum disorder: Improving the quality of life for children and their families", revealed that** teaching parents in the use of specific behavioral interventions targeting sleep problems for typically developing children is widely regarded as effective. As mentioned above, parent training, including parent education programs, is designed to teach parents strategies to improve their child's sleep.

Total scores of reported domains of practice of mothers of autistic children regarding care throughout program phases. The findings of the present study showed that the lowest mean score of mothers` awareness regarding mothers` eye contact with their autistic children that may be due to lack awareness of mothers` about skills of improving their eye contact with their autistic children, after implementation of the program this mean slightly increase with statistical significance differences. The improvement that occurs after program implementation this due to that the researcher learn the mothers varies strategies to overcome communication disturbance for their autistic children, such as the use of images, dolls, eye contact, gestures, and vocalizations.

In contrast, **Bassam & Tork, (2019)** concluded that the findings of their study about **" Education Program for Mothers of Children with Autism Spectrum Disorder: Mothers and Child Outcomes",** showed that the lowest mean score of mother's awareness regarding the care provided to their autistic children was related to social skills and communication disturbance before implementation of the program. while, after implementation of the program this mean slightly increase with statistical significance differences. This could be attributed to social isolation and poor communication of their autistic children and limited capacity for interpersonal relationships.

The present study found that highly significant positive correlation between total score of knowledge and practice of studied mothers (P= < 0.05) at post intervention (p>0.05). This may be due to when mothers had a high level of knowledge provide a satisfactory level of care for their autistic children. These findings were supported by **Mthimunye & Mwaba, (2014)** in a study about **"Knowledge and Experience of single mothers raising an autistic child in a low-income community in the Western Cap"**, who showed that there was statistically significant correlation between mothers' knowledge and both of awareness of mothers and change in an autistic child's behavior. These findings go in line with **Saad et al., (2020)** in a study about **"Parents' knowledge and Attitude Regarding their Autistic Children**", who reached to that there was a moderately positive correlation between knowledge level of parents and their attitude towards care of autistic children.

Conclusion:

Based upon the findings of the present study and answer of hypothesis, it was concluded that the training program is effective highly statistically improvement in mothers` care regarding autism, and mothers` care improved after implementation of training program.

Recommendations:

- ✓ Encourage continuous sharing of the mothers during the care of their children with autism by specialists to know the child's needs, problems and to be aware of different methods of care.
- ✓ New cooperation protocols between physicians, nurses and mothers should be designed to organize the treatment regimens of autistic children.

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Table (1): Characteristics of the studied autistic children.

Child characteristics	No. (50)		Percent (%)	
Age in years				
≤4 years	19		38.0	
>4 years	31		62.0	
Mean± SD	4.62±1.00			
Gender				
Male	42		84.0	
Female	8		16.0	
Child growth measurement as compared to his peers				
	Normal		Abnormal	
	No.	**(%)**	**No.**	**(%)**
Weight	31	62.0	19	38.0
Height	35	70.0	15	30.0
Head circumference	49	98.0	1	2.0
Birth order				
The first	13		26.0	
The second	21		42.0	
The Third and more	16		32.0	
Educational level				
Nursery school	10		20.0	
Primary school	1		2.0	
No education	39		78.0	

Table (2): Medical history of the studied autistic children.

Items	No. (50)	%
Onset (in years)		
≤2	3	6.0
2-4	41	82.0
>4	6	12.0
Mean± SD	3.37±1.02	
Degree		
Mild	2	4.0
Moderate	46	92.0
Severe	2	4.0
Duration (in years)		
≤1 year	32	64.0
>1 year	18	36.0
Mean± SD	1.25±0.39	
Signs and Symptoms of autism*		
Language development is slow or may not develop at all	29	58.0
Spend less time with others, showing less interest in composition of friendships with others	35	70.0
Be more sensitive than usual to touch, or to be less sensitive than usual to pain or hearing or smell	22	44.0
Stomach pain accompanied by nausea and vomiting	6	12.0
The child appears as if he doesn't hear	25	50.0
Doesn't like to embrace one	31	62.0
Not seen in the eye of speaker	47	94.0
Repeat the words of others	13	26.0
Resist change in routine	17	34.0
Have repetitive movements	33	66.0

SD: standard deviation, *: multiple response

Table (3): Characteristics of family of the studied autistic children.

Items	No. (50)	Percent (%)
Family types		
Nuclear	39	78.0
Extended	11	22.0
Residence		
Rural	34	68.0
Urban	16	32.0
Monthly income		
Sufficient	13	26.0
Insufficient	37	74.0
Consanguinity between father and mother		

Yes	12	24.0
No	38	76.0
Genetic history of autism in the family		
Yes	10	20.0
No	40	80.0
Number of children in family		
One	1	2.0
Two	27	54.0
Three or more	22	44.0

Table (4): Characteristics of mother of the studied autistic children.

Item	No. (50)	Percent (%)
Age (in years)		
≤35	32	64.0
>35	18	36.0
Mean± SD	34.22±6.19	
Marital status		
Married	47	94.0
Divorced	3	6.0
Widow	0	0.0
Level of education		
Illiterate	1	2.0
Read and write	4	8.0
Middle qualification	30	60.0
University education	15	30.0
Job		
Working	8	16.0
House wife	42	84.0
Psychological state (nervousness)		
Yes	13	26.0
No	37	74.0
Type of Labor		
Normal	12	24.0
Caesarian	38	76.0
Problems during pregnancy and childbirth		
Bleeding after the third month	11	22.0
Infection of some viruses such as measles	0	0.0
Taking some drugs	2	4.0
Lack of oxygen during childbirth	13	26.0
No problems	24	48.0

Table (5): Mother's knowledge regarding definition, factors affecting and signs and symptoms of autism throughout program phases.

Items	Study phase				MCp-value
	Pre		Post		
	No.	%	No.	%	
What is the autism$					
Is term given to a degree of mental retardation @	13	26.0	0	0.0	0.001**
Is a disorder in evolutionary growth which is characteriz deficient in sensory perception, language, abilit communicate and cognitive development	27	54.0	48	96.0	0.001**
Is a disorder in the social development of the child	12	24.0	38	76.0	0.001**
Is a disorder in physical growth@	3	6.0	0	0.0	0.001**
e. I don't know	9	18.0	0	0.0	0.001**
2. Factors that lead to autism$					
1-Genetics	22	44.0	41	82.0	0.001**
2-Parentral style and socialization	16	32.0	47	94.0	0.001**
3- Chemical agents	4	8.0	14	28.0	0.001**
4-Living conditions@	2	4.0	0	0.0	0.500
5-Unfavourable conditions for mother during the firs months of pregnancy such as (bleeding, some drugs, infection as measles and German measles)	4	8.0	44	88.0	0.001**
6-I don't know	14	28.0	0	0.0	0.001**
3. Signs and Symptoms of autism your child has $					
1-Language development is slow or may not develop at all	9	18.0	3	6.0	0.001**
2-Spend less time with others, showing less interest in composition of friendships with others	24	48.0	40	80.0	0.001**
3-Be more sensitive than usual to touch, or to be less sensitive than usual to pain or hearing or smell	1	2.0	18	36.0	0.001**
4-Don't imitate other movements and doesn't attempt to begin the work of fictional or innovative games	2	4.0	32	64.0	0.001**
5-Stomach pain accompanied by nausea and vomiting@	2	4.0	3	6.0	1.000
6-The child appears as if he doesn't hear	9	18.0	23	46.0	0.001**
7-Doesn't like to embrace one	20	40.0	46	92.0	0.001**
8-Not seen in the eye of speaker	25	50.0	47	94.0	0.001**
9-Repeat the words of others	8	16.0	33	66.0	0.001**
10-Resist change in routine	14	28.0	40	80.0	0.001**
11-Have repetitive movements	22	44.0	45	90.0	0.001**
12-No afraid of danger	12	24.0	45	90.0	0.001**
13-I don't know	9	18.0	0	0.0	0.001**

@: wrong answer, $: multiple response, MC: Mcnemar test, **: statistically highly significant (p<0.001)

Table (6): Mother's knowledge regarding the methods of treatment of autism and the problems of their autistic children throughout program phases.

Items	Study phase				MCp-value
	Pre		Post		
	No.	%	No.	%	
4- the methods of treatment for autistic children$					
1- Speech therapy	42	84.0	50	100.0	0.001**
2-Drug therapy	38	76.0	50	100.0	0.001**
3- Medical treatment	2	4.0	6	12.0	0.001**
4-Sensory integration therapy	10	20.0	50	100.0	0.001**
5-Psychotherapy	4	8.0	31	62.0	0.001**
6- Occupational therapy	0	0.0	3	6.0	0.250
7- Educational building methods	0	0.0	18	36.0	0.001**
8-Chemotherapy@	0	0.0	1	2.0	1.000
9-Social skills development	22	44.0	50	100.0	0.001**
10-Auditory integration therapy	0	0.0	17	34.0	0.001**
11-Behavoiral therapy	7	14.0	39	78.0	0.001**
12-Nutritional intervention	1	2.0	11	22.0	0.001**
13- I don't know	5	10.0	0	0.0	0.063
5. What are the problems of autistic child?$					
1-Meal times (difficulty in feeding)	4	8.0	44	88.0	0.001**
2-Unable to use toilet	5	10.0	50	100.0	0.001**
3-Sleep disturbance	2	4.0	44	88.0	0.001**
4-Behavoir, typical movements and frequent talk	26	52.0	36	72.0	0.001**
5-No fear of risks and accident	19	38.0	38	76.0	0.001**
6-Self-harm, tantrums and screaming	19	38.0	47	94.0	0.001**
7-Isolation from outside world	25	50.0	39	78.0	0.001**
8-Change challenge	6	12.0	23	46.0	0.001**

@: wrong answer, $: multiple response, MC: Mcnemar test, **: statistically highly significant (p<0.001)

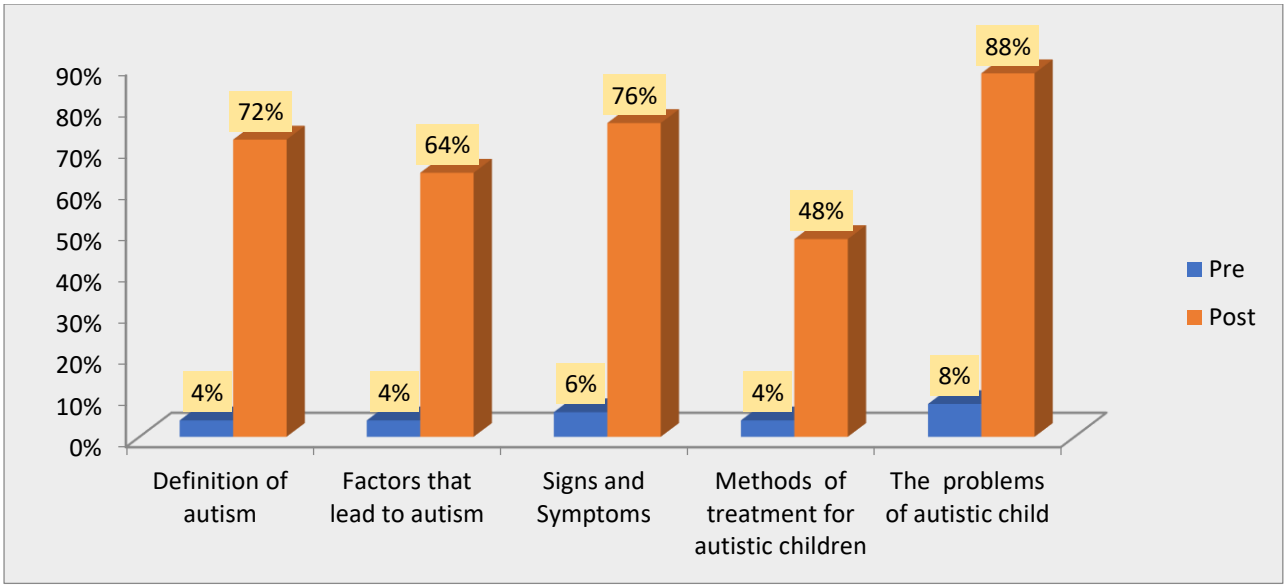

Figure (1): Total scores of domains of the mother's knowledge about autism throughout study phases.

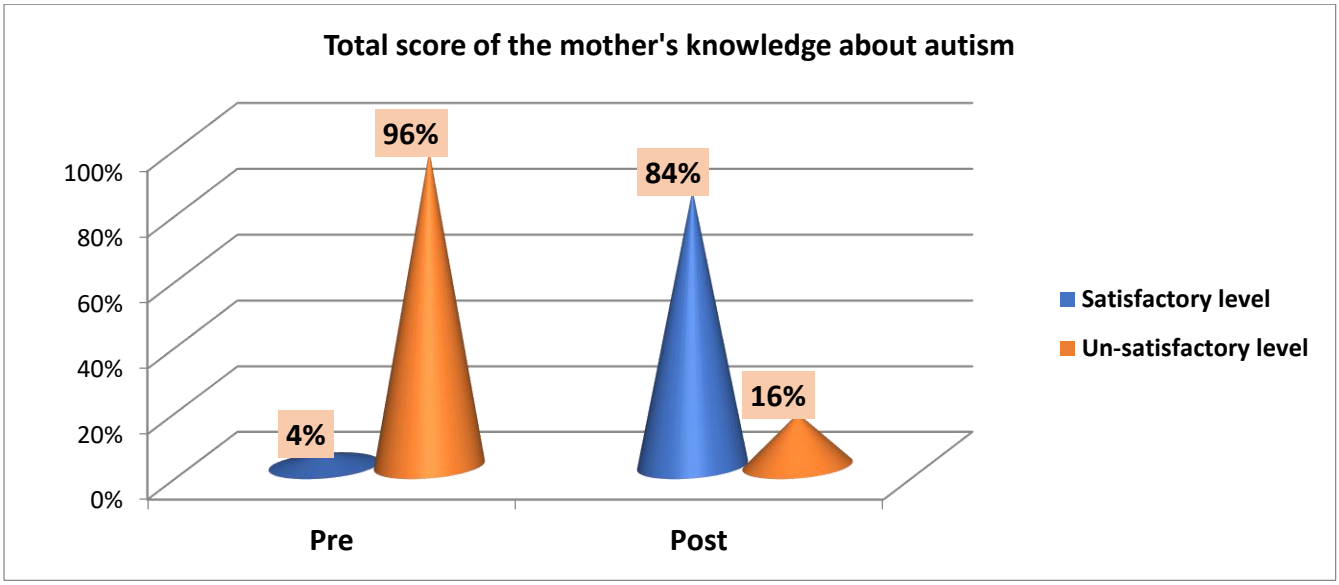

Figure (2): Bar chart showing Total score of the mother's knowledge about autism throughout study phases.

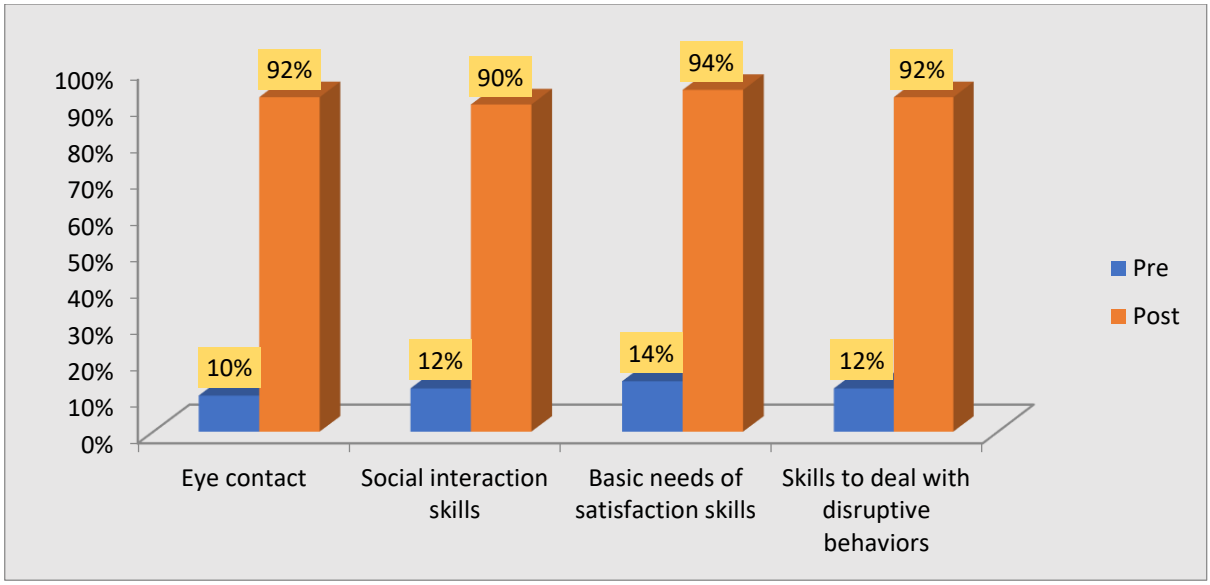

Figure (3): Total score of domains of mother's knowledge regarding practice throughout study phases

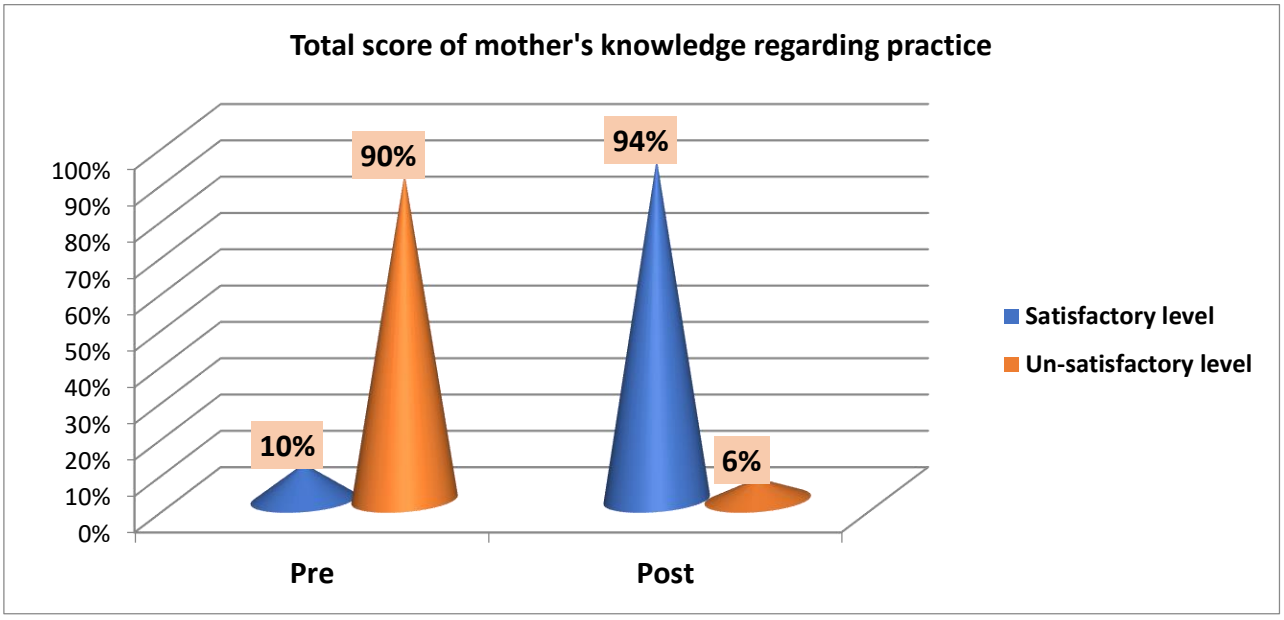

Figure (4): Bar chart showing Total score of mother's knowledge regarding practice throughout program phases

Table (7): Relation between total satisfactory mother's knowledge of studied autistic children and their family characteristics throughout study phases (n=50).

Family characteristics of children	Total satisfactory mother's knowledge level ≥60%				χ^2 (^{1}p-value)	χ^2 (^{2}p-value)
	Pre intervention (n=2)		Post intervention (n=42)			
	No	%	No	%		
Family types .						
Nuclear	2	100.0	35	83.3	FET (0.999)	FET (0.059)
Extended	0	0.0	7	16.7		
Residence						
Rural	2	100.0	29	69.0	FET (0.999)	FET (0.699)
Urban	0	0.0	13	31.0		
Monthly income						
Sufficient	2	100.0	33	78.6	FET (0.999)	FET (0.181)
Insufficient	0	0.0	9	21.4		
Consanguinity between father and mother						
Yes	0	0.0	11	26.2	FET (0.999)	FET (0.661)
No	2	100.0	31	73.8		
Genetic history of autism in the family						
Yes	0	0.0	8	19.0	FET (0.999)	FET (0.653)
No	2	100.0	34	81.0		
Number of children in family						
One	1	50.0	1	2.4	24.923 (0.001**)	12.121 (0.001**)
Two	1	50.0	27	64.3		
Three or more	0	0.0	14	33.3		

χ 2 : Chi square test FET: Fisher exact test non-significant(p>0.05), **: statistically highly significant (p<0.001), p^1: for pre-intervention, p^2: for post-intervention

Table (8): Relation between total satisfactory mothers` practice level and mothers` characteristics throughout program phases (n=50).

Mother's characteristics	Total satisfactory mother's practice level ≥60%				χ^2 (^{1}p-value)	χ^2 (^{2}p-value)
	Pre intervention (n=5)		Post intervention (n=47)			
	No	%	No	%		
Age per years .						
≤35	4	80.0	32	68.1	FET (0.642)	FET (0.042*)
>35	1	20.0	15	31.9		
Marital status						
Married	5	100.0	45	95.7	FET (0.99)	FET (0.173)
Divorced	0	0.0	2	4.3		
Level of education						
Illiterate	0	0.0	0	0.0	0.922 (0.820)	19.743 (0.001**)
Read and write	0	0.0	3	6.4		
Middle qualification	2	40.0	22	46.8		
University education	3	60.0	22	46.8		
Job						
Working	0	0.0	5	10.6	FET (0.577)	FET (0.001**)
House wife	5	100.0	42	89.4		

Psychological state (nervousness)						
Yes	0	0.0	11	23.4	FET (0.309)	FET (0.162)
No	5	100.0	36	76.6		
Type of Labor						
Normal	2	40.0	11	23.4	FET (0.582)	FET (0.99)
Caesarian	3	60.0	36	76.6		
Problems during pregnancy and childbirth						
Bleeding after the third month	1	20.0	10	21.3	0.476 (0.924)	1.375 (0.711)
Taking some drugs	0	0.0	2	4.3		
Lack of oxygen during childbirth	1	20.0	13	27.7		
No problems	3	60.0	22	46.8		

χ 2 : Chi square test FET: Fisher exact test non-significant(p>0.05), p[1]: for pre-intervention, p[2]: for post-intervention

Table (9): Relation between total satisfactory mother's practice level of studied autistic children and their family characteristics throughout study phases (n=50).

Family characteristics	Total satisfactory mother's practice level ≥60%				χ 2 ([1]p-value)	χ 2 ([2]p-value)
	Pre intervention (n=5)		Post intervention (n=47)			
	No	%	No	%		
Family types .						
Nuclear	4	80.0	37	78.7	FET (0.99)	FET (0.534)
Extended	1	20.0	10	21.3		
Residence						
Rural	5	100.0	31	66.0	FET (0.163)	FET (0.542)
Urban	0	0..0	16	34.0		
Monthly income						
Sufficient	5	100.0	36	76.6	FET (0.309)	FET (0.162)
Insufficient	0	0.0	11	23.4		
Consanguinity between father and mother						
Yes	0	0.0	11	23.4	FET (0.319)	FET (0.99)
No	5	100.0	36	76.6		
Genetic history of autism in the family						
Yes	0	0.0	9	19.1	FET (0.569)	FET (0.496)
No	5	100.0	38	80.9		
Number of children in family						
One	1	20.0	0	0.0	12.140 (0.002**)	17.763 (0.001**)
Two	4	80.0	27	57.4		
Three or more	0	0.0	20	42.6		

χ 2: Chi square test FET: Fisher exact test non-significant (p>0.05), **: statistically highly significant (p<0.01), p[1]: for pre-intervention, p[2]: for post-intervention

Table (10): Correlation Coefficient between total scores of knowledge and practice of studied mothers through program Phases (n=50).

Parameter		Practice score			
		Pre Intervention		Post Intervention	
		(r)	P	(r)	P
knowledge score	Pre			0.026	0.859
	Post	0.351	0.013*		

Nonsignificant (p>0.05) *: statistically significant (p<0.05), r: correlation coefficient