

Effect of Training Program on Improving Maternal Knowledge Regarding their Autistic Children

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Abstract

Background: Autism Spectrum Disorder (ASD) is a specific developmental disability characterized by social and communication impairments, as well as by restricted interests and repetitive behaviors. Autism is become increasing and there is no enough knowledge about it in our society, therefore it is important to shed a light on such issue.

The aim of this study was to evaluate the effect of training program on improving mothers' knowledge about autism.

Design: A quasi-experimental study design was carried out. **S**

etting: Speech and Hearing clinic at AL Ahrar Hospital, College of Education of Disability and Rehabilitation at Zagazig University, 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)** Mothers' knowledge regarding autism structured interview questionnaire.

Results: The study results revealed highly statistically significant improvement in mothers' knowledge regarding autism including definition, causes, signs and symptoms, treatment throughout the study phases pre and post the intervention ($P < 0.001$).

Conclusion: The training program is effective in improving mothers' knowledge regarding autism.

Recommendation: Orientation of the mothers of autistic children about community resources, care setting and recent information. It is also recommended that future studies with more focus on knowledge about autism.

Keywords: Effect, Training program, Mothers' knowledge, 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).

The provision of information to families is essential to ensure the proper long-term management the disease and assist in making decisions about necessary treatments/therapies. This enables them to actively participate in children's therapy, chosen together with a professional team. Thus, support for these families has been the focus of several professionals, institutions, and policies (Edwards et al., 2018).

Families need information regarding the characteristics of ASD (definition, cause, possibility of cure, prognosis and the probability of having another child with ASD, child's routine and behavior; future rights and expectations. It is important that parents are aware of the characteristics and aspects that involve ASD, in order to focus on searching for resources for children and necessary interventions, depending on the different community contexts in which families live. It is pointed out that families would like to know information involving children with ASD. There are several therapies that help promote child development (Weissheimern et al., 2021).

Benallie, (2019) revealed that parent knowledge of ASD may, theoretically, impact early diagnosis of ASD, and therefore affect access to early intervention services. Improving knowledge of ASD among parents may, in turn, enhance the well-being and developmental outcomes of children affected with ASD. Parents should be provided with education about ASD to be aware of the early signs of ASD and to communicate concerns to a professional promptly.

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 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. 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 was to evaluate the effect of training program on improving maternal knowledge regarding their autistic children.

This aim was fulfilled through the following objectives to:

1. Assess mothers' knowledge regarding their children with autism.
2. Develop and implement a training program according to mother's needs to improve mothers' knowledge

3. Evaluate the effect of training program on improving maternal knowledge regarding their autistic children.

Research Hypothesis:

Knowledge of mothers' of autistic children will be improved after implementation of the 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- Mothers' knowledge regarding autism structured interview questionnaire to assess the study subject's knowledge regarding autism. It included: definition, factors lead to autism, signs and symptoms of autism, the methods of autism treatment and problems of autistic children

Scoring system:

According to the answers obtained from mothers, a scoring system was followed. Each correct answer was scored 1 point and zero for wrong one. The total score for the questionnaire was 38 points. **The total knowledge 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 \pm 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 \geq 0.05 was considered statistically non-significant.

Results

Table (1) showed that 62% of studied children aged more than 4 years old, with mean \pm SD of 4.62 \pm 1.00 years. Also, 84 % of the studied children were males compared to 16 % were female. 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, 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 were: 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) pointed to characteristics of mothers of studied children. It was found that 64% of mothers with autistic children at age group \leq 35year with a mean of 34.22 \pm 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. 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 (4) 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. 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 (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 ($p < 0.001$).

Table (7) illustrated relation between total satisfactory mothers' knowledge of studied autistic children and their children characteristics throughout program. It was found that no statistically significant relation was found between total satisfactory mothers' knowledge of studied autistic children and their children characteristics at pre- and post- intervention ($P = > 0.05$).

Relation between total satisfactory mothers' knowledge of studied autistic children and mothers' characteristics throughout program illustrated in **table (8)**. It was found that there was no statistically significant relation at pre-intervention between total satisfactory mothers' knowledge of studied autistic children and mothers' characteristics ($P = > 0.05$). While, there was highly statistically significant relation between total satisfactory mothers' knowledge at post intervention and mothers' characteristics as age and educational level ($P = < 0.001$).

Relation between total satisfactory mothers' knowledge of studied autistic children and their family characteristics throughout program illustrated in **table (9)**. 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 ($P < 0.001$).

Discussion:

Autism spectrum disorder (ASD) is a neurodevelopmental disorder, manifested either in social communication and interaction deficits, or in restrictive and repetitive patterns of behaviour, 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. Parent training Program can assess the needs of the child and the family and offer support according to the needs of the family. Parents are also involved as active participants of any intervention program (Ardiyani et al., 2020).

Concerning mother's knowledge regarding definition, predisposing factors and signs and symptoms of autism throughout the program phases, the present study showed that a marked improvement in mothers' knowledge about definition, predisposing factors and signs and symptoms of autism child had at post implementation of educational training program with highly statistically significant difference ($P < .001$) throughout the program phases. The result of present study may be attributed that there was not any educational program about autism

performed for included mothers of autistic children as increasing awareness will enhance early diagnosis and treatment seeking lead to better outcomes. These findings matched with study by Keshk et al., (2020) who conducted study about "Evaluation of the educational program for mothers and its effect on knowledge and practice towards their children with autism in Qassim region" and showed there was a highly satisfactory knowledge of Autism mothers regarding Autism after implementation of educational program compared with pre implementation. Also, there were highly statistically significant difference of Autism definition and predisposing factors.

Alyami et al., (2022) in a recent study about "Knowledge and Attitudes toward Autism Spectrum Disorder in Saudi Arabia", showed that the lowest percentages of correct answers were items related to knowledge about ASD treatment and etiology, reporting that knowing the risk factors for ASD is crucial in lowering the chances of having children with the disorder. Early detection of the disorder can lead to better outcomes, as it can also lead to significant changes in a child's linguistic, cognitive, and adaptive behavior.

Concerning the total knowledge level of mothers regarding autism. When the results were analyzed, our findings of the present study indicated that majority of mothers had an unsatisfactory level of knowledge about autism before implementation of the program. Meanwhile, after implementation of the program majority had a high level of knowledge about autism. This difference could be related to the nature and the effect of the program, its content; teaching methods and interactive media used to impart knowledge. Also, it could be attributed to poor awareness and lack of attending any training program about autism. As well as more than half of mothers were had a low and middle qualification is reflecting the unsatisfactory level of knowledge, when the educational level of the mothers decreased, the incidence of autism awareness significantly decreased and education contributes to the rising trend in autism awareness, and enables early diagnosis, and treatment among educated mothers, and their environment.

Bassam & Tork, (2019) in a study about " Education Program for Mothers of Children with Autism Spectrum Disorder: Mothers and Child Outcomes", stated that the improvement in knowledge can be influenced by the rate of memorization, ability of knowledge acquisition, the accumulation of learned knowledge of life, and the refreshing information using a different approach of active learning during the implementation of the program, such as work activities, group discussion, video session, and group activities.

On the same way, Silva et al., (2018) in a study conducted in Brazil entitled "Impact of a provider training program on the treatment of children with autism spectrum disorder at psychosocial care units in Brazil", found that there was a general post-training improvement in knowledge and management of ASD patient.

These results were in disagreement with Khudhair & Jassim, (2018) who conducted a study about "The Knowledge of Autistic Children's Mothers Regarding Autism in Basra City", who stated that their study showed that mothers of autistic children have sufficient knowledge

about autism and showed that this result may be due to mothers' level of education which played an important role in improvement mother's information, as there was no mothers' level of education less than primary school and most of them education range between secondary school and college.

Regarding personal characteristics of the studied autistic children, Concerning characteristics of studied autistic children. Regarding gender of autistic children included in this study, there was a male preponderance in the present study and other studies. In the present study, it was revealed that majority of the studied children were males, which is considered another confirm for all previous nursing researches which indicate that boys more frequent to have autism than girls. This result in same line with study by **Samy et al., (2021)** entitled "**Clinical and Laboratory Characteristics of Children with Autism Spectrum Disorder at Sohag University Hospital**" and presented that majority of the studied sample were males. These findings were matched with **Saad et al., (2020)** in a study about "**Parents' knowledge and Attitude Regarding their Autistic Children**", indicated that more than two third of them were male. These findings supported that the high percentage of child with autism was in male.

In contrast, the previous findings were differed from the results of **Ali et al., (2020)** who conducted study about "**knowledge assessment among autistic children's parents regarding autism spectrum disorder in Egypt**" who stated that majority of children were females. **Beggiato et al., (2017)** reported that girls were more likely to be under-identified by some diagnostic instruments for ASD, and thus, the lower rates of ASD diagnosis compared to boys.

Concerning their age, the current study presented that the majority of the studied children their age was more than 4 and less than 6 years old, with mean \pm SD of 4.62 ± 1.00 years. It may be due to difficult to diagnosis autism before the 3 years most of the time autism can be diagnosed when child enter the school where the interaction, without signs occur, reflect abnormal behaviors. Many children are not diagnosed with ASD until 4- 6 years of age. This finding in agreement with result **Ali et al., (2019)**, who reported that most of the children were in the age group from 4 to less than 5 years old. Also, **Alwakeel et al., (2013)** who conducted a study to **assess the effect of early intervention program for developing mother's skills to deal with their autistic children and to reduce some of their children's disruptive behaviors**, in Egypt who stated that the included autistic children were from 3-6 years old.

As regard to medical history of studied autistic children, the current study reported that majority of children had moderate ASD. This finding was consistent with study done by **Yousef et al., (2021)** about "**Prevalence and risk factors of autism spectrum disorders in preschool children in Sharkia, Egypt: a community-based study**" and stated that most 65% of autistic children were mild to moderate ASD. these results were in disagreement with an Egyptian study conducted by **El baz et al., (2011)** about "**Risk factors for autism: an Egyptian Study**" and found that less than half of cases had mild to moderate degree of ASD. Those differences were because of the variations in methodology and studied age groups.

Regarding characteristics of mothers of autistic children, Mousa et al., (2021) conducted a study entitled “**Evaluation of Mothers' Knowledge about Autism: Saudi Arabia**”, stated that the participants varied as to educational qualifications with secondary school being the most common. This result was in harmony with the current study as most of mothers had middle education.

Mohamed et al., (2020) in a study about “**Knowledge assessment among autistic children's parents regarding autism spectrum disorder**”, reported that about three quarter of studied mothers were living in urban area. Similarly, these findings were matched with yousef et al., (2021) who reported that most 65% of mothers were from urban. These findings differed from the present study which showed that 68% of studied mothers were from rural areas.

In the current study, it was found that there was no statistically significant relation at pre-intervention between total satisfactory mothers' knowledge of studied autistic children and mothers' characteristics ($P = > 0.05$). While, there was highly statistically significant relation between total satisfactory mothers' knowledge of studied autistic children at post intervention and mothers' characteristics as age and educational level.

A survey, disagreed with result of our study concerning relation between total satisfactory mothers' knowledge and mothers' job, conducted by Deeb, (2016) about “**Knowledge of parents of children with autism spectrum disorder of behavior modification methods and their training needs accordingly**” revealed inconsistent findings related to the influence of career on the capability to distinguish signs and symptoms of autism in children. The level of education of the caregiver had no impact on their behaviors with children with autistic characteristics.

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' knowledge regarding autism, and mothers' knowledge improved after implementation of training program.

Recommendations:

- ✓ Orientation of the mothers of autistic children about community resources, care setting and recent information
- ✓ Patient-centered interventions to overcome barriers and educating them about the importance of adherence. It is also recommended that future studies with more focus with more focus on knowledge about autism.

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

Items	Study phase				MC _p -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 characterized by deficient in sensory perception, language, ability to 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-Parental 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 first six months of pregnancy such as (bleeding, some drugs, viral 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				MC _p -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)

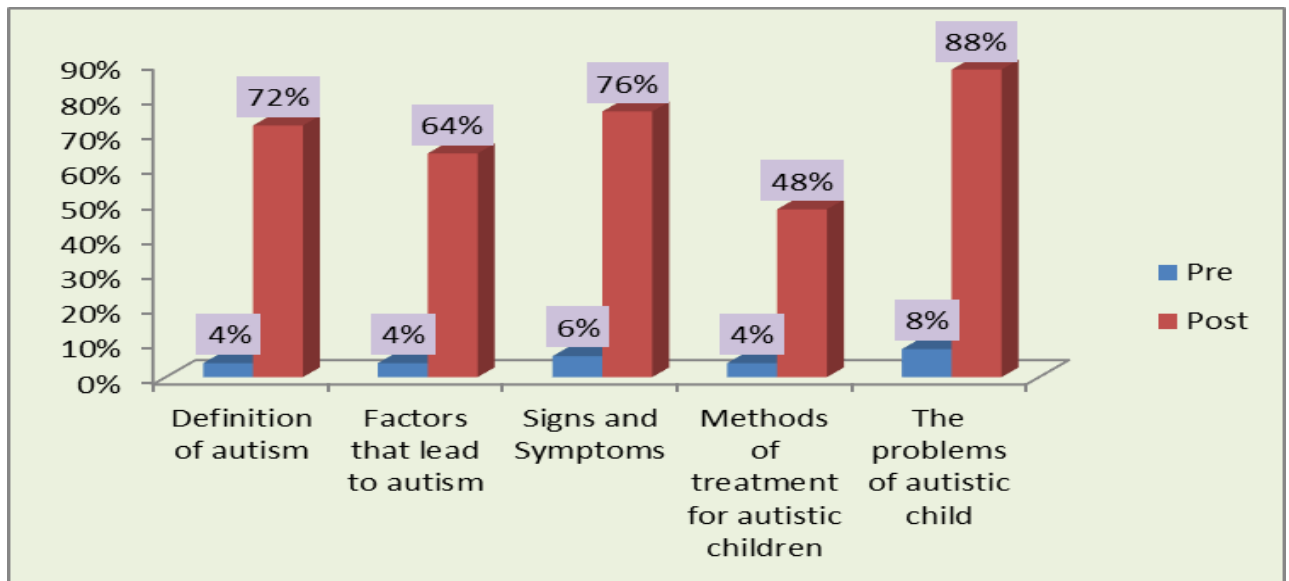
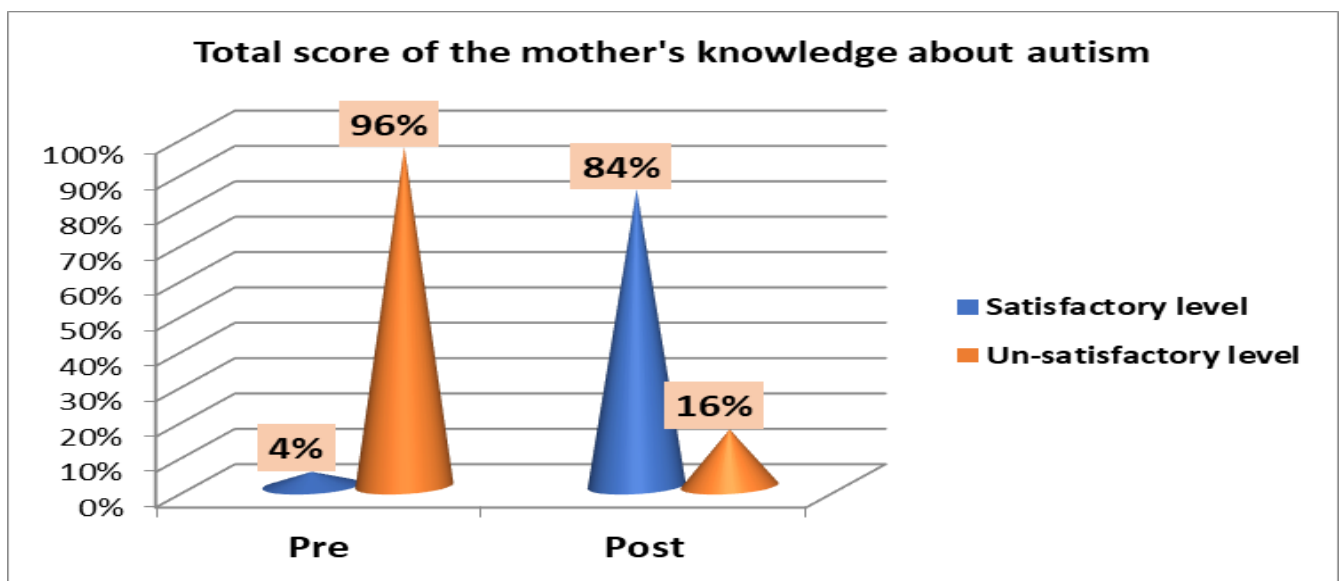


Figure (1): Total scores of domains of the mother's knowledge about autism throughout study phases.



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

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

Characteristics of children		Total satisfactory mother's knowledge level				χ^2 (¹ p-value)	χ^2 (² p-value)
		≥60%					
		Pre intervention (n=2)		Post intervention (n=42)			
		No	%	No	%		
Age per years							
≤4 years		0	0.0	14	33.3	FET (0.519)	FET (0.232)
>4 years		2	100.0	28	66.7		
Gender							
Male		1	50.0	34	81.0	FET (0.297)	FET (0.324)
Female		1	50.0	8	19.0		
Child growth measurement as compared to his peers							
Weight	Normal	2	100.0	27	64.3	FET (0.519)	FET (0.459)
	Abnormal	0	0.0	15	35.7		
Height	Normal	2	100.0	31	73.8	FET (0.999)	FET (0.220)
	Abnormal	0	0.0	11	26.2		
Head circumference	Normal	2	100.0	41	97.6	FET (0.999)	FET (0.999)
	Abnormal	0	0.0	1	2.4		
Birth order							
The first		0	0.0	12	28.6	0.784 (0.676)	4.092 (0.129)
The second		1	50.0	19	45.2		
The Third and more		1	50.0	11	26.2		
Educational level							
Nursery school		0	0.0	10	23.8	0.588 (0.745)	2.686 (0.261)
Primary school		0	0.0	1	2.4		
No education		2	100.0	31	73.8		

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 (8): Relation between total satisfactory mother's knowledge of studied autistic children and their mothers' characteristics throughout program phases (n=50).

Mother's characteristics	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	%		
Age per years						
≤35	2	100.0	31	73.8	FET (0.530)	FET (0.001**)
>35	0	0.0	11	26.2		
Marital status						
Married	2	100.0	40	95.2	FET (0.999)	FET (0.414)
Divorced	0	0.0	2	4.8		
Level of education						
Illiterate	0	0.0	0	0.0	0.233 (0.972)	30.590 (0.001**)
Read and write	0	0.0	0	0.0		
Middle qualification	1	50.0	20	47.6		
University education	1	50.0	22	52.4		
Job						
Working	0	0.0	8	19.0	FET (0.999)	FET (0.324)
House wife	2	100.0	34	81.0		
Psychological state (nervousness)						
Yes	0	0.0	10	23.8	FET (0.999)	FET (0.413)
No	2	100.0	32	76.2		
Type of Labor						
Normal	0	0.0	10	23.8	FET (0.999)	FET (0.999)
Caesarian	2	100.0	32	76.2		
Problems during pregnancy and childbirth						
Bleeding after the third month	1	50.0	10	23.8	1.369 (0.713)	3.100 (0.376)
Taking some drugs	0	0.0	2	4.8		
Lack of oxygen during childbirth	0	0.0	9	21.4		
No problems	1	50.0	21	50.0		

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 (9): 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