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Education Program for Mothers of Children with Autism Spectrum Disorder: Mothers and Child Outcomes

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Abstract **Background:** Mothers play an important role in supporting their children with autism. They not only drive the decision making process, but they take a primary role in delivering the intervention. Consequently, they require advice, emotional support, and training in working with their children through providing education for mothers to update and accurate information about available treatment options and support services for autism. This study aimed to assess the effects of an education program for mothers of children with autism spectrum disorder on mothers and child outcomes. **Design: A quasi experimental design was used in this work. Setting:** This study was conducted at two settings, namely; Speech and Hearing clinic at Al Ahrar Hospital and Speech clinic at Zagazig University Hospitals**. Subjects:** Included all accessible autistic children aged 3 – 12 years (n=50) and all accessible mothers of autistic children (n=50). **Three tools** were used for data collection, namely; A questionnaire, interview sheet, Mother's knowledge regarding the care provided to their autistic children, and Child observation sheet. **The results:** The highest percentage of mothers had an unsatisfactory and low levels of knowledge and awareness regarding the care provided to autistic children before implementation of the program (80% &76%, respectively). Meanwhile, after implementation of the program, the majority of mothers had a satisfactory and moderate levels of knowledge and awareness with a statistical significance differences (70% & 70%, respectively). Before implementation of the program the half of mothers reported that their autistic child's behavior had a moderate defect level (50 %). While after the implementation of the program this percentage increases to 60% but still moderate. **Conclusion:** It was found that there were a positive correlation between mothers' knowledge and both of awareness and change in autistic child's behavior scores after implementation of the program. Also, there was a positive correlation between change in autistic children behavior and mothers' awareness scores after implementation of the program. **Recommendations:** Conduct awareness raising program to improve knowledge and attitude of the community towards the autistic children and their families through mass media.

Keywords: *autism, education program, knowledge, mothers, practice*

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1. Introduction

Children with autism spectrum disorder and their families face the likelihood of poor health, social care, mental health service, rehabilitation, lack of special education and access to equal opportunities [1]. The majority of children with autism spectrum disorder in Egypt remain at home uneducated. They are given little to no education because they either drop out of mainstream schools or parents cannot afford the scarce and expensive private schools. Meanwhile, parents receive a low level of support to their children with autism spectrum disorder [2,3].

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 [4].

According to [5] Autism spectrum disorder is a developmental disorder that involves a wide range of problematic behaviors, including deficits in language and perceptual and motor development, defective reality testing, and an inability to function in social situations. Autism is a brain disorder that typically affects a child's ability to communicate, or relationship with others and responds appropriately to the environment. Some children with autism are relatively high functioning, with speech and intelligence intact, others are mentally retarded mute, or have serious language delays [6].

Autism is the result of a deregulated immune system in children that is triggered by a virus or genetic disposition**,** it is may be caused by intrauterine, prenatal or neonatal stress or trauma, as well as the metabolic condition,

diabetes, hypertension, and obesity during pregnancy and the use of antidepressant drug especially during the first trimester can increase the risk of autism [7]. In addition to, the environmental factors that have been claimed to contribute to autism include certain foods, infectious diseases, smoking, alcohol and about forty percent of autism risk were linked to genetics [8].

The core autism spectrum disorder features, associated symptoms and behavior problems of the autism spectrum disorder, perhaps will cause significant negative impact on families and parental this included: emotional stress, ongoing financial burden of expensive treatments and therapies, a significant strain on family relationships, changes in family roles, structure and activities, feeling of guilt and blame regarding diagnosis and social stigma [9,10].

According to a report by the **Centers for Disease Control and Prevention (CDC)** autism spectrum disorder occurs in approximately 1 in 68 children. Boys are five times more likely than girls to have autism spectrum disorder [11]. In Egypt, autism is one of the greatest problems that vary often under-diagnosed or more commonly, misdiagnosed. According to the latest demographic studies, there are more than 140.000 children in Egypt, who suffer from autism [12]. In one Egyptian study, the prevalence of autistic disorder, according to diagnosis and statistical manual classification in Alexandria was 2.126/10.000 [13].

Mothers of autistic children take on the responsibilities of diagnosis, advocacy, and daily care. There is evidence that this impacts upon their quality of life, had higher levels of modeling, stress, they have great difficulties in accepting the diagnosis of their children due to lack of knowledge, social stigma, and skills in establishing a healthy communication with their children to maintain their social emotional and physical development in a healthy way. Also, they tend to report more depression, and greater pessimism about their child's future than other mothers of children with other developmental disabilities [14].

Mothers play an important role in supporting their children with autism. They not only drive the decision making process, but they take a primary role in delivering the intervention. Consequently, they require advice, emotional support, and training in working with their children through providing education for mothers to update and accurate information about available treatment options and support services for autism [15].

Mothers' education is defined as an educational effort that aims to enhance or facilitate mothers' behaviors that will influence positive developmental outcomes in their children. The aim is that of teaching skills designed to help mothers teach skills to their children, help them emotionally regulate, manage problem behaviors and improve the quality of the parent-child relationship. Mothers' education can increase mothers' knowledge and skills in the areas of managing behavior, teaching their child's communication and social skills [16]. In addition, mothers' education has two other potential benefits: reducing parent stress and increasing parenting sense of competence and the mothers who received educational materials and therapist support with behavior problems reported feeling more competent about their parenting and demonstrated lower levels of dysfunctional parenting practices than controls [17].

1.1. Significance of the Study

Autism is a lifelong disorder that most of the mothers have to live and care for their children on their own forever. So they are faced with difficulties and unique daily stresses associated with their children's autistic disorder. There is a dramatic rise in the number of reports documenting increasing rates of autism cases, no researches have been published about the implementation of educational program for mothers with autistic children in Arab countries, especially those of the middle East. Children with autism spectrum disorder shows many behaviors and characteristics that pose a challenge to all members of their family, especially their mothers. One factor that may be important to strengthen the psychological wellbeing and decreasing mothers' stress, involves being mindfully aware about the disease. Therefore the training program for mothers are considered a viable solution in reducing these behaviors and characteristics, so it is expected that this study contributes to enhance mothers knowledge and awareness about autism and develop the skills to properly care for their autistic child when behavior and communication are at their worst.

1.2. Aim of the Study

To assess the effects of an education program for mothers of children with autism spectrum disorder on mothers and child outcomes through:

-Assess mothers' knowledge about autism.

-Assess mothers' awareness regarding the care provided to their autistic children.

-Assess autistic child behavior from mothers' opinion.

-Implement educational programs about autism for mothers

-Assess the effects of education program on mothers' knowledge, awareness and autistic child behavior.

1.3. Research Hypotheses

1-Mothers' knowledge about autism will be improved after implementation of the educational program.

2- Mothers' awareness regarding the care provided to their autistic children will be improved after implementation of the educational program.

3- Autistic child behavior will be improved after implementation of the educational program.

2. Subject and Methods

2.1. Research Design

A quasi experimental design was used to conduct the present study.

2.2. Setting

The study was conducted at two settings, namely; Speech and Hearing clinic at Al Ahrar Hospital and Speech clinic at Zagazig University Hospitals.

2.3. Subject

The subjects of this study consist of two groups

The group I: All accessible autistic children during three months (n=50) who fulfilled the following criteria; both genders, their age range from 3 – 12 years and free from any chronic diseases and congenital anomalies.

Group II: All accessible mothers of autistic children during three months (n=50) who attended the above mention settings.

2.4. Tools of Data Collection

Three tools were used to collect data for this study.

Tool I: A questionnaire interview sheet

It was developed by the researcher through reviewing related literature [18,19,20]. It consists of four parts:

- **Part I:** Personnel characteristics of the studied mothers, including age, level of education and occupation.
- **Part II:** Personnel characteristics of the studied children, including age, gender, birth order, and level of education.
- **Part III:** Child medical history as onset and behavioral problem.
- **Part IV:** To assess mothers' knowledge about autism, it consists of 28 questions classified as follows: definition of autism (2 questions), factors lead to autism (4 questions), signs and symptoms of autism (11 question), and methods of autism treatment (11 question).

The scoring system:

The responses were one score for correct answers, and zero for incorrect answers. The total score for each mother were calculated and converted into percent score by dividing the mothers total score by the maximum possible score. The level of knowledge score was satisfactory if the knowledge scores equal and more than 75% and unsatisfactory if the score less than 75%.

Tool II: A questionnaire interview sheet to assess the awareness of mother's knowledge regarding the care provided to their children suffering from autism. It was developed by the researcher through reviewing related literature **[18,19,20]**. And consists of 187 points grouped under many skills, namely; self -care skills of autistic child (9 points),

Social skills (4 points), motion skills (6 points), concentration skills (6 points), difficulty in feeding (18 points), failure to use the toilet (16 points), sleep disorder (22 points),

No fears from risks and accident (12 points), self- harm, tantrums and screaming (18 points),isolationism (18 points), loss of a sense of self- esteem and self –confidence (14 points), stereotype behavior and frequent talk(14 points), language communication impairment (18 points), and changing resistance(12 points),

Scoring system

The responses of the participants to Likert type questions were measured on a scale rating from never (1 score), sometimes (2 score) to always (3 score). The level of awareness score was higher if the awareness score equal and more than 75%, the level of awareness was moderate if the score range from 50% to less than 75%, and low if less than 50%.

Tool III: Child Observation sheet:

It was developed by the researcher through reviewing related literature [17,19] to assess the autistic child behavior from mother's opinion. It consists of 73 points grouped under six behaviors which are; social relation (13 points), imitation/ verbal response (13 points), Use object and things (13 points), audio/visual and motor responses (10 points), Emotional and physical response (11 points), and Adapt to changes (13 points).

The responses of the participants for four Likert type were measured on a scale rating from mild defect (1 score), moderate defect (2 score), severe defect (3 score) to normal level (4 score). The level of the autistic child behavior was sever defect if the defect equal and more than 70%, moderate defect if the score range from 50% to less than 70%, and mild defect if less than 50%.

Reliability

The reliability of the tools of data collection through estimating its internal consistency which used Cronbach alpha coefficient. The reliability coefficient for the first tool was 0.89, 0.87 for the second tool and 0.92 for the third tool.

Validity

The tools were tested for content validity by five experts (three professors of pediatric nursing, Faculty of Nursing, Cairo University, and two professors from Faculty of Nursing, Ain Shams University. The recommended modifications were done and the final form was ready for use.

Training Program:

The training program has been developed for the mothers with autistic children. The objective of the program was to enhance the mother’s knowledge about autism and practice regarding autistic child behavior.

Field work:

Preparatory phase:

During this phase, the researcher reviewed local and international literature to get more knowledge about the study. This also helped in designing the study tools. The mothers were interviewed to fill the sheets before implementation of the training program to assess their training needs regarding autism. Based on the result of pre-test, the mothers learning needs were identified. Accordingly, the objectives of the program were stated and the content was designed.

Implementation phase:

The program designed for this study has been implemented through 7 sessions (of which 1 theory session cover knowledge about autism spectrum disorder such as; definition of autism, causes, risk factors, signs and symptoms and disorders associated with autism, management of autism,

In addition to 6 practical sessions to learn the mothers techniques to acquire of various skills to deal with their autistic child's behaviors such as improve the nonverbal and verbal communication, increase

Appropriate play skills, social interaction, how to deal with the difficulty in feeding, failure to use the toilet, and sleep disorder. These sessions lasted for 13 hours in the form of group sessions. Typically, sessions were held about twice - weekly basis. The mothers were divided into two groups, each group about 25 mothers.

The researcher used various teaching methods to attract mothers' attention and motivate them to participate such as lectures, group discussion between the researcher and mothers on activities to develop targeted child skills and review of previous techniques and mothers having to implement new skills in daily living routines, and provided mothers with opportunities to share stories and knowledge and explore experiences. The teaching media included; video clips to introduce new skills to mothers, posters and a copy of the program used that contain a picture to receive the information easily.

Evaluation phase

The program evaluation was applied two times for mothers one before the program and second occurred immediately after completion of the training program.

Pilot study:

It was carried about 10% of mothers who provided care for their children suffering from autism to test the clarity and applicability of the sheets and to estimate the length of time needed to fill the sheets. No modifications were done and the sample was added to the total study sample.

Field work:

Data collection took a period of four months starting from January till April 2019. The mothers were interviewed to fill the sheets after complete explanation of the purpose of the study and asking for their participation. Throughout the interview, relative information was recorded on the designed sheets depending upon the response of the participant. The time used for finishing each interview ranged between 30- 45 minutes, according to mother's physical and mental readiness.

Administrative Design:

An official permission was obtained by submission of formal letters issued from the Dean of the Faculty of Nursing, Zagazig University to the responsible authorities of the study setting to obtain their permission for data collection.

Ethical Considerations:

The study was approved by the Ethics Committee at the Faculty of Nursing; Zagazig University. The verbal explanation of the nature, purpose, and benefits of the study was performed by the researcher to mothers included in the study sample. Oral consent was taken from subjects and reassured them about confidentiality and anonymity of the study. They were informed about their right to refuse or withdraw from the study at any time without giving a reason.

2.5. Statistical Design

Data entry and statistical analysis were performed using computer software, the statistical package for social sciences (SPSS), version 14. Suitable descriptive statistics were used such as; frequency, percentage, mean and standard deviation. The chi – square test was used to detect the relation between the variables. T-test was also applied to study the relation between the study variables. In addition, correlation coefficient (r) test was used to estimate the close association between variables. P-values which were less than 0.05, 0.001 were considered as statistically significant and highly significant respectively.

3. Results

Personal characteristics of studied mothers were portrayed in Table 1. It was found that 26% of mothers with autistic children in age group of 30 to less than 35 years with a mean of 32.9±7.2 years. The highest percentages of mothers were illiterate and housewife (72 % & 92 %, respectively). As well as 90% of the mothers had insufficient income.

Table 1. Personal Characteristics of Studied Mothers (n=50)

Mothers Characteristics	(N=50)	
	No	%
Age in year		
20-	6	12%
25-	11	22%
30-	13	26%
35-	10	20%
40+	10	20%
Mean± SD	**32.92±7.26**	
Educational Level		
Illiterate	36	72%
Read and write	1	2%
Middle qualification	11	22%
University	2	4%
Occupation		
Housewife	46	92%
Working	4	8%
Monthly income		
Sufficient	5	10%
Insufficient	45	90%

Table 2 showed characteristics of the autistic child's family. It was found that 70% &60% of autistic children lived in nuclear families and from urban areas respectively. Regarding to consanguinity it was found that 60% of parents had no consanguinity relationship between parents. Whereas, 64% of the families had no history of autism.

Table 2. Characteristics of Autistic Child's Family (n=50)

Family Characteristics	(N=50)	
	No	%
Area of Resident		
Rural	20	40%
Urban	30	60%
Consanguinity		
Yes	20	40%
No	30	60%
Family history of autism		
Yes	18	36%
No	32	64%
Crowded index		
1	15	30%
2	25	50%
3	9	18%
4	1	2%
Family Type		
Extended	15	30%
Nuclear	35	70%

Table 3. Personal Characteristics and Medical History of Studied Children (n=50)

	(N=50)	
	No	**%**
Personal Characteristics		
Age in year		
3-<6	30	60%
6-12	20	40%
Mean +SD	**6.8 ±2.5**	
Gender		
Male	35	70%
Female	15	30%
Weight		
Normal	47	94%
Abnormal	3	6%
Height		
Normal	48	96%
Abnormal	2	4%
Head circumference		
Normal	45	90%
Abnormal	5	10%
Child order		
First	30	60%
Second	10	20%
Third	6	12%
Fourth	4	8%
Five or more		
Educational level		
Nursery	18	36%
Primary	32	64%
Medical history		
Autism onset		
1st year	4	8 %
2nd year	10	20%
3rd year	30	60%
4th year	6	12%
Degree of autism		
Sever	15	30%
Moderate	25	50%
Mild	10	20%
Duration of autism(years)		
<5 years	35	70%
5+	15	30%

Personal characteristics and medical history of studying children were depicted in Table 3. In relation to characteristics of studying children, the mean age was 6.8 ± 2.5 years and 70% of study children were males. Regarding to anthropometric measurement it was found that normal measurement in relation to the normal value of weight 94%, height 96%, and head circumference 90%. Concerning to birth order, it was found that 60% of the studied children were ranked as the first child. In addition, 64% of children were in primary education.

Regarding to the medical history of studying children it was clarified that 60% of children were diagnosed with autism disability from the third year of age and 50% of autistic children have a moderate degree of autism. Concerning to duration of autism disability 70% of autistic children were had duration<5 years.

Levels of mothers' knowledge regarding autism throughout the program phases are presented in Table 4. Before implementation of the program the highest percentage of mothers (80%) had unsatisfactory knowledge regarding autism. After the implementation of the program, the majority of them (70 %) had a satisfactory level of knowledge.

Mean score of mother's awareness regarding care of their autistic children throughout the program phases were showed in Table 5.

It was found that there is a statistically significant difference between the mean score of mother's awareness regarding all care provided to autistic children before and after program implementation (p=<0.001).

Levels of mothers' awareness regarding care of their autistic children throughout the program phases are presented in Table 6. Before implementation of the program the highest percentage of mothers (76%) had a low level of awareness. While after the implementation of the program the majority of mothers (70 %) had a moderate level of awareness.

Autistic children's behavior levels as reported by mothers throughout the program phases was presented in Table 7. Before implementation of the program the half of mothers reported that their autistic child's behavior had a moderate defect level (50 %). While after the implementation of the program this percentage increases to 60%, but still in moderate defect level with a statistical significance differences.

The relation between mother's knowledge levels and their personal characteristics throughout the program phases was illustrated in Table 8. It was found that there were statistical significant differences between the educational level of mothers, family income and their satisfactory total knowledge score after program implementation (χ^2 =16.819, 2.834& p= < 0.05, respectively).

The relation between mother's awareness levels and their personal characteristics throughout the program phases was illustrated in Table 9. It was found that there was a statistical significant difference between the educational level of mothers, family income and their awareness levels after program implementation (χ^2=17.713, 18.612 & p= < 0.05, respectively).

The relation between autistic children's behavior levels and personal characteristics of mothers throughout the program phases was illustrated in Table 10. It was found that there were no statistical significant differences between autistic children's behavior levels and personal characteristics of mothers throughout the program phases.

Correlation between the knowledge, awareness of mothers and autistic child's behavior scores throughout the program phases was illustrated in Table 11. It was found that there were a positive correlation between knowledge and both of mothers' awareness and change in autistic child's behavior scores after implementation of the program (r= 0.187*,. 255*& p=0.048&.018, respectively). Also, there was a positive correlation between change in autistic child's behavior and mothers' awareness scores after implementation of the program (r= 0.211& p=0.022).

Table 4. Levels of Mothers' Knowledge Regarding Autism Throughout the Program Phases (n=50)

Level of knowledge	Before		After		Chi-square	p-value
	N	%	**N**	%		
Satisfactory (Scores 60% and more)	10	20%	35	70%	10.922	0.000
Unsatisfactory (Scores < 60%)	40	80%	15	30%		

Table 5. Mean Score of Mother's Awareness Regarding Care of Their Autistic Children Throughout the Program Phases (n=50)

Domains	**Before (N=50)**	**After (N=50)**	**T test**	**P value**
	Mean±SD	**Mean±SD**		
Self-care skill	12.3256±2.81777	17.0349 ±1.53736	-13.716	<0.001**
Social skill	2.3605±1.26410	4.2093±1.43990	-8.934	<0.001*
Motor skill	12.4884±8.69042	19.9070±10.65019	-9.758	<0.001**
Attention and concentration skill	8.7791±2.57774	14.2209±3.74292	-11.701	<0.001**
Difficulty in feeding	9.7093±3.41576	15.4884±3.15760	-10.378	<0.001**
Failure to use toilet	7.6691±2.466374	12.2109±2.64292	10.601	<0.001**
Sleep disorder	9.1047±2.62131	13.8140±3.77456	-10.208	<0.001**
No fear from risks and accidents	11.3953±2.84617	17.2093±3.73573	-11.140	<0.001**
Self-harm, tantrums and screaming	18.3140±5.09732	28.1744±6.49378	-10.417	<0.001*
Isolationism	5.0233±2.34635	10.1047±2.34661	-14.527	<0.001**
Loss of a sense of self - esteem and self - confidence	11.4884±3.22397	17.6163±3.88411	-10.888	<0.001**
Stereotype behavior and frequent talk	4.0234±1.34535	8.1047±2.33661	-12.527	<0.001**
Communication impairment	2.8605±1.34744	5.2209±1.46650	10.98	<0.001**
Changing resistance	11.3488±3.35986	18.1163±3.86057	-11.973	<0.001**

Table 6. Mothers' Awareness Levels Regarding Care of Their Autistic Children Throughout The Program Phases (n=50)

Level of awareness	**Before**		**After**		**Chi-square**	**p-value**
	N	%	**N**	%		
High (Scores 75% and more)	4	8	5	10	11.912	0.000
Moderate (Scores 50%- < 75%)	8	16	35	70		
Low (Scores < 50%)	38	76	10	20		

Table 7. Autistic Children Behavior levels as Reported by Mothers Throughout The Program Phases (n=50)

Behaviors impairment levels	**Before**		**After**		**Chi-square**	**p-value**
	N	%	**N**	%		
Mild defect (Scores < 50%)	10	20	10	20	10.122	0.000
Moderate defect (Scores 50%- < 75%)	25	50	30	60		
Sever defect (Scores 75% and more)	15	30	10	20		

Table 8. Relation Between Mother's Knowledge Levels And Their Personal Characteristics Throughout The Program Phases (n=50)

Personal characteristics	**Satisfactory level of Knowledge**			
	Before program		**After program**	
	N	**%**	**N**	**%**
Mother age				
20-	3	50	4	66.7
25-	5	45.5	9	81.8
30-	9	69.2	12	92.3
35-	4	40	9	90
40+	7	70	8	80
	χ^2 3.342 p > 0.05		χ^2 2.435 p > 0.05	
Educational Level				
Illiterate	19		25	
Read and write	0	0.0	1	100
Middle qualification	7	63.6	9	90
University	1	50	2	100
	$\chi^2$2.945 p > 0.05		**χ^2 16.819 p< 0.05***	
Family income				
Sufficient	3	60	4	80
Insufficient	8	17.8	10	22.2
	χ^2 0.654 p > 0.05		**χ^2 2.834 p< 0.05***	
Mother's occupation				
Working	3	75	4	100
Housewife	25	54.3	43	93.5
	χ^2 0.637 p > 0.05		χ^2 0.278 p > 0.05	

Table 9. Relation Between Mother's Awareness Levels And Their Personal Characteristics Throughout The Program Phases (n=50).

Personal characteristics	Mothers awareness											
	Before program						After program					
	High		Moderate		Low		High		Moderate		Low	
	N	%	N	%	N	%	N	%	N	%	N	%
Mother age												
20-	2	33.4	1	16.6	3	50	3	50	1	16.6	2	33.4
25-	3	27.3	2	18.2	6	54.5	4	36.3	2	18.2	5	45.5
30-	3	23.1	4	30.8	6	46.1	4	30.8	5	38.4	4	30.8
35-	2	20	2	20	6	60	5	50	2	20	3	30
40+	0	0.0	7	70	3	30	4	40	2	20	4	40
	χ^2 5.178 P > 0.05						χ^2 6.182 P > 0.05					
Educational Level												
Illiterate	5	13.9	6	16.7	25	69.4	9	25	8	22.2	19	52.8
Read and write	0	0.0	0	0.0	1	100	1	100	0	0.0	0	0.0
Middle qualification	2	18.2	5	45.5	4	36.3	9	81.8	2	18.2	0	0.0
University	1	50	0	0.0	1	50	2	100	0	0.0	0	0.0
	χ^2 0.883 P > 0.05						**χ^2 17.713 P< 0.05***					
Family income												
Sufficient	1	20	2	40	2	40	4	80	1	20	0	0.0
Insufficient	5	11.1	10	22.2	30	66.7	6	13.3	6	13.3	33	73.4
	χ^2 1.091 P > 0.05						**χ^2 18.612 P < 0.05***					
Mother's occupation												
Working	0	0.0	1	25	3	75	1	25	1	25	2	50
Housewife	6	13.1	9	19.5	31	67.4	8	17.4	15	32.6	23	50
	χ^2 0.182 P > 0.05						χ^2 0.553 P > 0.05					

Table 10. Relation Between Autistic Children Behavior levels and Personal Characteristics of Mothers Throughout The Program Phases (n=50)

Personal characteristics	Practice levels											
	Before program						After program					
	Sever defect		Moderate Defect		Mild defect		Sever defect		Moderate Defect		Mild defect	
	N	%	N	%	N	%	N	%	N	%	N	%
Mother age												
20-	1	16.6	2	33.4	3	50	1	16.6	31	50	2	33.4
25-	2	18.2	3	27.3	6	54.5	2	18.2	4	36.3	5	45.5
30-	3	23.2	5	38.4	5	38.4	4	30.7	6	46.1	3	23.2
35-	1	10	1	10	8	80	2	20	5	50	3	30
40+	0	0.0	3	30	7	70	2	20	4	40	4	40
	χ^2 4.167 P > 0.05						χ^2 5.172 P > 0.05					
Educational Level												
Illiterate	6	16.7	5	13.9	25	69.4	9	25.1	12	33.3	15	41.6
Read and write	0	0.0	0	0.0	1	100	0	0.0	1	100	0	0.0
Middle qualification	2	18.2	4	36.3	5	45.5	10	90.9	1	9.1	0	0.0
University	0	0.0	0	0.0	2	100	2	100	0	0.0	0	0.0
	χ^2 0.675 P > 0.05						χ^2 4.612 > 0.05					
Family income												
Sufficient	1	20	0	0.0	4	80	5	100	0	0.0	0	0.0
Insufficient	5	11.1	30	66.7	10	22.2	4	8.9	8	17.8	33	73.3
	χ^2 1.081 P > 0.05						χ^2 3.512 P > 0.05					
Mother's occupation												
Working	1	25	1	25	2	50	2	50	1	25	1	25
Housewife	6	13.1	13	28.2	27	58.7	5	17.4	18	32.6	23	50
	χ^2 0.171 P > 0.05						χ^2 0.562 P > 0.05					

Table 11. Correlation between the knowledge, awareness of mothers and Autistic children behavior scores throughout the program phases (n=50)

Variables	Knowledge pre		Autistic children behavior pre		Knowledge post		Change in autistic children behavior post	
	r	P value	r	P value	r	P value	r	P value
Awareness pre	.029	.794	.029	.794	-.086	.432	-.013	.906
Awareness post	.029	.794	-.017	.876	0.187*	0.048	0.211*	0.022
Knowledge post	-.086	.432	-.017	.876	-	-	.255*	.018
Change in autistic children behavior post	-.013	.906	-.113	.300	.255*	.018	-	-

4. Discussion

Autism is a neurodevelopmental condition with biological, genetic, environmental and developmental causes, which are still not clearly understood. Children on the autism spectrum (AS) face challenges that arise from their difficulty in understanding social behavior and interaction, difficulty in understanding and effectively using communication, and difficulty with having reduced flexibility of thought and behavior [21].

Families living with autism spectrum disorder (ASD) face many challenges, affecting not only the child with ASD and development but also family functioning and quality of life. Women's education (PE) in ASD has been identified as a priority intervention for this group both internationally and nationally **[22]**. Women's education is an educational effort that aims to enhance or facilitate women's behaviors that will influence positive developmental outcomes in their children. The aim is that of teaching skills designed to help women teach skills to their children, help them emotionally regulate, manage problem behaviors and improve the quality of the women -child relationship [18].

Therefore, the current study aimed to assess the effects of an education program for mothers of children with autism spectrum disorder on mothers and child outcomes.

With respect to the hypotheses introduced in literature review, the results of the present study supported the research hypotheses.

The findings of the present study indicated that the mean age of the mothers was thirty two years and the highest percentages of them were illiterate, housewives, had insufficient monthly income, and reside in the urban area. This may be due to the low socioeconomic status of mothers who have not completed education and they prefer to stay at home to take care of their children, also as results of their responsibility to spend a part of their effort and time on the care and follow-up of their children with autism. This result could be due to the high cost of medical care in developing countries as Egypt, which make a burden on the family budget.

This finding is in agreeing with El Sawy [23] who study some environmental and genetic determinants of autism in Egyptian children, and found that the mean age of the mothers was thirty two years and found that, maternal occupation was highly demonstrated in the sample were housewives and constitute a higher proportion of the studied groups which reside in the urban area. Also, the findings of this study are confirmed by the results of Amr et al, [24] who study the social-demographic factors in Arab children, especially in Egypt and Jordan and found that most of them belonged to families of low socioeconomic standards with unsatisfactory income.

Regarding to the medical history of studying children it was clarified that the majority of children were diagnosed with autism disability from the third year of age and the half of autistic children have a moderate degree of autism. Concerning to duration of autism disability the most of autistic children were had duration<5 years. The findings of the present study showed that the highest percentage of mothers reported that autism appear in their children prior to three years. This may be due to that the studied children were ranked the first child, and parent might be not enough oriented to growth and development of normal children due to lack of experience.

This finding was inconsistent with Hassab Roubo et al, [25] who conducted a study about parental awareness regarding care of their children suffering from autism at Ain Shams University. They found that the degree of autism can range from mild to moderate. Also, this result agrees with Simsek and Koroglu [26] who study the characteristics of parents of children diagnosed with autism and found that half of children with autism ranged from 1-5 years.

Regarding to gender of studying children, the majority of autistic children were males. This may be due to there is a genetic factor may affect boys more than girls. These findings were consistent with Mohamed [27] who study the counseling intervention for parents caring for children with autism and found that less than three quarter of the children with autism was males. In addition to that, another study supported by Elhossiny and Farida [28] who conducted a study on the effect of hyperbaric oxygen therapy in Egyptian autistic children at Ain Shams University who found that males were more affected than females.

The findings of the current study revealed that almost studied children had normal physical measurements. The findings of this study show that autism had no effect on physical measurement. These results are supported by the study findings conducted at Zagazig City by Abd El-Gawaad [29] who found that almost of autistic children had normal physical measurements and the half of them had a moderate degree of autism.

Concerning the total knowledge level of mothers regarding autism. The findings of the present study indicated that the highest percentage of mothers had an unsatisfactory level of knowledge about autism before implementation of the program. Meanwhile, after implementation of the program the highest percentage of mothers had a high level of knowledge about autism. This could be attributed to poor awareness and lack of attending any training program about autism. As well as the majority of mothers were illiterate and had a 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.

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.

These results are supported by other research findings by Abd-Allah et al, [30] who study the effect of a sensory integration program on the development of children with autism at Menoufia and found that the majority of mothers had an unsatisfactory level of knowledge about autism Also the study of Abed El- Gawaad, [29] who evaluated mother's knowledge regarding the care provided to their autistic children and found that the majority of mothers had an unsatisfactory level of knowledge about autism.

Again the study conducted in Australia by Farmer & Reupert [31] who assess the effect of educational program on parent knowledge about autism and showed that there was a highly significant improvement in parent' knowledge after the program implementation. In the same line, the study conducted by Cutress& Muncer [32] who found that the majority of parents with autistic children had a low level of knowledge about autism before implementation of the program. Meanwhile, after implementation of the program the highest percentage of parents had a high level of knowledge about autism. As well as, the study of Preece and Trajkovski [22] who assess the impact of education program for parent with autistic children and found that the education program improved parent knowledge regarding autism compared to pre- program implementation.

The findings of the present study indicated that the highest percentage of mothers had a low level of awareness toward care provided to their autistic children before implementation of the program. Meanwhile, after implementation of the program the highest percentage of mothers had a moderate level of awareness. This could be attributed to lack of attending any training program about autism, and the nature of their children with autism not makes the mother to seek more information about the care of autistic children, such as professionals, media, and website, as well as, the mothers' poor awareness can be interpreted in general ways of behavior modification because children with autism are showing a lot of unwanted behaviors. Making women's trying various ways to reduce them, and as a result, the training they learn many methods to modify the behavior this give the explanation for this result. These findings agreed with the study conducted in Nepal by Heys et al [33] who found that the parents had a lack level of awareness about care provided to their autistic children.

The findings of the present study showed that the highest mean score of mother's awareness regarding the care provided to their autistic children was related to self- harm before implementation of the program, while after implementation of the program this mean increased with a statistical significance differences. This could be attributed to majority of autistic children scratched themselves, hand - biting because they did not know to verbalize their emotions. In this respect My Asperger child [34] who proved that many children on the autism spectrum did not know how to adequately verbalize their emotions. As a result, they may act-out their uncomfortable feelings of self-injuring. The most common forms of these behaviors include: hand- biting, head –banging, and excessive self –rubbing and scratching.

The findings of the present study 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 a statistical significance differences. This could be attributed to social isolation and poor communication of their autistic children and limited capacity for interpersonal relationships and when the social skills they have been taught fail them in the real world. 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.

These findings agreed with Wong & Kwan [35] 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 one hand, Carter et al, [36] who reported no main effect of the parent intervention program on changes of the knowledge of the parent regarding the care provided to autistic child regarding communication outcomes.

The finding of the current study revealed that before implementation of the program half of mothers reported that their autistic child's behaviors had a moderate defect level. While after the implementation of the program this percentage slightly increase, but still in moderate level with a statistical significance differences. This result may be due to lack of media awareness about autism and how to care and deal with it. 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. Those children need for special rehabilitative and behavioral programs dealing with their behavioral problems. This improvement could be assigned to one or more rationales, which include the comprehensive content of the training program, the written handout of the program which contain a picture which serves as ongoing reference, mother's interest and keenness to know, encouragement of questions, interactive talk with the utilization of multimedia. As well the mothers were satisfied with the content of the program and they endeavor to apply what learn in a program to improve the behaviors of their children. As well as the mothers were trained in the program with various techniques to stimulate the behavior of their children and they were trained in these procedures via instructions, observation of a videotape this give the explanation for this result.

In this respect, Baron-Cohen et al, [6] who mentioned that the autism is a brain disorder that typically affects a

child's ability to communicate, or relationship with others and responds appropriately to the environment. Also the study of Santrock [5] who stated that the Autism Spectrum Disorder is a developmental disorder that involves a wide range of problematic behavior, including deficits in language and perception and an inability to function in social situations.

These findings agreed with Matson et al, [37] who found that there are a statistically significant improvement in the autistic child's behavior after implementation of a parent training program. Also the study of Schultz et al [17] who found that there are a statistically significant improvement in the autistic child's behavior after implementation of a parent training program. As well as, Rogers and Dawson [38] who found that the parent intervention program was associated with slightly gains of autistic child's behavior. Again the study of George & Sakeer [39] who found that there are statistically significant improvement in the autistic child's behavior after implementation of the awareness program for parents.

In the current study there were a statistically significant relation between educational level, monthly income of the studied mothers and both of knowledge and awareness scores after implementation of the program. This result may be due to that more educational level of mothers and sufficient monthly income of the family lead to increase their knowledge and awareness about autism.

These findings agreed with Pickard & Ingersoll [40] who found that the parents of children with autism and of a higher socioeconomic status were more aware of service options for their child in comparison to parents of a lower socioeconomic status. Also the Abd El- Gawaad , [29] who found that there was statistically significant relation between the educational level of the mothers and their knowledge about autism. Again the study of Anwar [41] who found that the parents from the upper class identifying more signs and symptoms of autism.

On the other hand, this finding contradicted with Hassab Roubo et al, [25] who found that there was no statistically difference between mother's educational level and their awareness related to care provided to autistic children. Also the Jordan-based study of Deeb [42]who found that the level of education of mothers having an effect on their behavior modification skills towards their autistic child.

The findings of the present study indicated that there was a positive correlation between knowledge of mothers and both of mothers awareness and change in autistic child's behavior scores after implementation of the program. This may be due to when mothers had a high level of knowledge provide a satisfactory level of care for their autistic children. Theses findings were supported by Mthimunye and Mwaba [43] who showed that there were statistically significant relation between mothers' knowledge and both of awareness of mothers and change in an autistic child's behavior

5. Conclusion

Based on the findings of the present study, it can be concluded that the highest percentage of mothers had an unsatisfactory and low levels of knowledge and awareness regarding autism before implementation of the program. Meanwhile, after implementation of the program, the majority of mothers had a satisfactory and moderate levels of knowledge and awareness with a statistical significance differences. Before implementation of the program half of mothers reported that their autistic child's behaviors had a moderate defect level. While after the implementation of the program this percentage slightly increase, but still in moderate level with a statistical significance differences.

6. Recommendations

In the light of the findings of the current study, the following recommendations are suggested:

1-Orientation of the mothers of autistic children about community resources, care setting and recent information.

2-Conduct awareness raising program to improve knowledge and attitude of the community towards the autistic children and their families through mass media.

3-Simple illustrated booklets, posters and guidelines for mothers about the care of their autistic children should be available in each setting providing care for those children.

4- 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.

5- Conducting practical training programs for members of the families of children with autism spectrum disorder focuses on behavior modification techniques.

6-Develop the competence of mothers in order to deal with children with autism in the proper manner through:

-Mothers should focus on positive and praise the child instead of punishment.

- Mothers should give encouragement to child to get involved in different activities to gain confidence and competence.

- Mothers should provide a stimulating environment for children in order to grow in a holistic manner.

7-It is imperative to develop a training program for workers in the educational system to learn skills on how to work with children with Autism. This will help to ensure that the children with Autism are taught the right behaviors and will receive the most benefit from their education

8-Future research in this field requires studies with larger sample sizes and fewer methodological weaknesses, so that results can be more easily generalized.

References

[1] Gobrial E, McAnelly S, and Shannon P. (2018). The education of children and young people with autistic spectrum disorders in Egypt. British Journal of Learning Disabilities; 47(1):29-34.

[2] Mendoza R. (2010). The Economics of Autism in Egypt. American Journal of Economics and Business Administration; 2(1): 12-19.

[3] Omar M. (2014). Early intervention services as perceived by parents of children with autism in Egypt and Saudi Arabia. The International Interdisciplinary Journal of Education; 3(1): 238-49.

[4] American Psychiatric Association. (2014). Diagnostic and statistical manual of mental disorders: DSM-IV(5th ed). Arlington, VA: American Psychiatric Publishing. P:76.

[5] Santrock J W. (2011). Child Development, Tata Mc Graw Hill Edition (13) New Delhi.

[6] Baron-Cohen S, Lombardo M V, Auyeung B, Ashwin E, Chakrabarti B & Knickmeyer R (2011). Why are autism spectrum conditions more prevalent in males. PLoS Biol J; 9(6): 10-22.

[7] Mostafa G A and Shehab A A. (2010). The link of C4B null allele to autism and to a family history of autoimmunity in Egyptian autistics children. Journal of neuroimmunol; 223(1-2): 115-119.

[8] Kirk S, Galloghor J and Coleman M R (2014):Educating exceptional children.14th ed .Cengage learning, United State of America, p:144.

[9] DePape A M and Lindsay S (2014): Parents' Experiences of Caring for a Child with Autism Spectrum Disorder. Qualitative Health Research J; 25(1): 569-83.

[10] Weiss J, Wingsiong A and Lunsky Y (2014): Defining crisis in families of individuals with autism spectrum disorders. J Autism; 18(1): 985-95.

[11] Centers for Disease Control and Prevention (CDC). (2014). Prevalence of autism spectrum disorder among children aged 8 years – autism and developmental disabilities monitoring network, 11 sites, United States. MMWR Surveill Summ; 63(2): 1-21.

[12] Zaki R A and Moawad G E (2016). Influence of autism awareness on psychological wellbeing of mothers caring for their children with autism. Journal of nursing education and practice; 6(9): 90-100.

[13] Ismail R A and Ibrahim S A (2013). A study of serum interleukin 12 in a sample of autistic children in Egypt. Unpublished Master Thesis. Faculty of Medicine. Alexandria University. P: 2.

[14] Pisula E (2011). Parenting stress in mothers and fathers of children with autism spectrum disorder, a comprehensive book on autism spectrum disorder. 1st ed. Phildelphia, p:559.

[15] Kamei A. (2013). Perception and experiences of mothers who have children with autism spectrum disorder. Published Doctoral Thesis. Faculty of the Graduates school. University of North Carolina. p:35.

[16] Prata J, Lawson W and Coelho R. (2018). Parent training for parents of children on the autism spectrum: a review. International Journal of Clinical Neurosciences and Mental Health; 5(3):1-8.

[17] Schultz T R, Schmidt C T and Stichter J P. (2011). A Review of Parent Education Programs for Parents of Children With Autism Spectrum Disorders. Focus on Autism and Other Developmental Disabilities J; 26(2): 96-104.

[18] Steiner A, Koegel L, Koegel R, Ence W. (2012):. Issues and theoretical constructs regarding parent education for autism spectrum disorders. J Autism Dev Disord; 42(6):1218-27.

[19] Bearss K, Johnson C, Smith T, Lecavalier L, Swiezy N and Aman M. (2015). Effect of parent training vs parent education on behavioral problems in children with autism spectrum disorder: a randomized clinical trial. AMA Manual of style Online J; 313(15): 1524-33.

[20] Matthews N, Orr B, Harris B, McIntosh R, Openden D, Smith C and Matthews A. (2018). Parent and child outcomes of JumpStart™, an education and training program for parents of children with autism spectrum disorder. Research in Autism Spectrum Disorders J; 56(1): 21-35.

[21] Wing L, Gould J and Gillberg C. (2011). Autism spectrum disorders in the DSM-V: Better or worse than the DSM-IV?. Research in Developmental Disabilities J; 32(2):768-73.

[22] D and Trajkovski V (2017): Parent education in autism spectrum disorder – a review of the literature. Hrvatska revija za rehabilitacijska istraživanja; 53(1): 128-138.

[23] El Sawy M. (2011). Study of some environmental and genetic determinants of autism in Egyptian children. International Journal of Psychology and Counseling; 3(8): 130-136.

[24] Amr M, Ali W B, Hablas H , Raddad D , El-Mehesh F , El-Gilany A and Al-Shamy H. (2012). Socio-demographic factors in Arab children with Autism Spectrum Disorders. Pan African Medical Journal; 11(1): 65-72.

[25] Hassab Roubo K M, Ouda W E and Bayoumi O R. (2010). Parentral awareness regarding care of their children suffering from autism. Unpublished Master Thesis, Faculty of Nursing, Ain Shams University.

[26] Simsek B and Koroglu Y. (2012). A study on the demographical characteristics of parents with children diagnosed with autism, problem they face and their knowledge on alternative treatment methods. Procedia - Social and Behavioral Sciences J; 47(1): 577-585.

[27] Mohamed E. (2012). Counseling intervention for parents caring for children with autism. Published Doctorate Thesis. Faculty of Medicine. University of Ain Shams. P: 55-62.

[28] Elhossiny M and Farida E. (2014). Study the effect of hyperbaric oxygen therapy in Egyptian autistic children: A clinical trial. The Egyptian Journal of Medical Human Genetics; 15(2): 155-162.

[29] Abd El- Gawaad H E. (2017).:Maternal care provided to their autistic children at Zagazig City. Unpublished Master Thesis. Faculty of Nursing. Zagazig University. P:46-94.

[30] Abd-Allah G A, Khalifa M I, Mahmoud A T, Zin-Eldein N A and Khouessah H M. (2016). Effect of a sensory integration program on the development of children with autism. Unpublished Doctoral Thesis. Faculty of Nursing. Menoufia University. P:108.

[31] Farmer J and Reupert A. (2013). Understanding autism and understanding my child with autism: an evaluation of a group parent education program in rural Australia. Australian Journal of Rural Health; 21(1): 20-27.

[32] Cutress A L and Muncer S J. (2014). Parents' views of the National Autistic Society's EarlyBird Plus Programme. J Autism; 18(6): 651-657.

[33] Heys M , Alexander A, Medeiros E, Tumbahangphe K M, Gibbons F, Shrestha R, Manandhar M, Wickenden M, Shrestha M, Costello A, Manandhar D and Pellicano E (2017). Understanding parents' and professionals' knowledge and awareness of autism in Nepal. J Autism; 21(4): 436-449.

[34] My Asperger child. (2015). Addressing self-harm behavior in children on the autism spectrum. Available at: http://www.Myaspergerchild.com/2015/04/ addressing self-harm – behavior-in-html.Accessed at November 5, 2016.

[35] Wong V C N and Kwan O K (2010). Randomized controlled trial for early intervention for autism: a pilot study of the Autism 1-2-3. Project. Journal of Autism and Developmental Disorders; 40(6): 677-688.

[36] Carter A S, Messinger D S, Stone W L, Celimli S, Nahmias A S and Yoder P. (2011). A randomized controlled trial of Hanen's "more than words" in toddlers with early autism symptoms. Journal of Child Psychology and Psychiatry and Allied Disciplines; 52(7): 741-752.

[37] Matson M L, Mahan S and Matson J L. (2009). Parent training: A review of methods for children with autism spectrum disorders. J Research in Autism Spectrum Disorders; 3(1): 868-875.

[38] Rogers S J and Dawson G. (2012). The Early Start Denver Model for Young Children with Autism: Promoting Language, Learning, and Engagement. Journal of nursing sciences; 5 (1):22-34.

[39] George L and Sakeer S. (2013). Awareness about Autism among Parents. International Journal of Science and Research; 4(9): 1525-1530. P:24-95.

[40] Pickard K E and Ingersoll B R. (2016). Quality versus quantity: the role of socioeconomic status on parent reported service knowledge, service use, unmet service needs, and barriers to service use. J Autism; 20(1):106-115.

[41] Anwar M (2018). Knowledge, Awareness, and Perceptions Regarding Autism Among Parents in Karachi, Pakistan. Cureus Journal of Medical Science; 10(9): 20-34.

[42] Deeb RM. (2016). Knowledge of parents of children with autism spectrum disorder of behavior modification methods and their training needs accordingly. Int Educ Stud; 9(1): 141-154.

[43] Mthimunye B and Mwaba K. (2014). Knowledge and Experience of single mothers raising an autistic child in a low income community in the Western Cap. Published Master Thesis. Faculty of Medicine. University of Western Cap. P:43.

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