

Effect of an Educational Program on Knowledge, Strains and Coping Patterns of the Family Care Givers having Autistic Children

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Abstract: Back ground: Autism is a complex developmental disability that appears during the first three years of life affecting children's ability to communicate with others. Aim: the present study was quasi-experimental aiming to assess the effect of an educational program on knowledge, strains and coping patterns of the family caregivers having autistic children. Setting: the study was conducted in Children and Adolescent Psychiatric Outpatient Clinic in Suez Canal University Hospital, Four Primary Schools, Wyana Institution for Integration and Rehabilitation, El-Aml Center for Children with Special Needs, El-Tathkief El-Fekri Institution and the Psychiatric Measures Clinic at Ismailia city. The sample: included 36 caregivers and 36 autistic children. Data were obtained through interviewing them using three tools: structured interview questionnaire, caregiver strain questionnaire-short form and brief cope scale. The results: revealed that 44.4% versus 86.1% of the studied caregivers had unsatisfactory and satisfactory total knowledge regarding autism, strains/stressors and coping pre/post-program respectively with a statistically significant difference ($P = 0.000$). The total strain scores of the studied caregivers were high among 77.8% and still high among 88.9% of them pre/post-program respectively with no statistically significant difference ($P > 0.05$). The majority (97.2% and 91.7%) of the studied caregivers had high total coping scores pre/post-program respectively with no statistically significant difference ($P > 0.05$). Conclusion: the educational program significantly increased the total knowledge of the studied caregivers and insignificantly nearly maintained their total coping. However, it was insignificantly ineffective in decreasing the total strains of the studied caregivers. Recommendation: Emphasize the importance of carrying out educational programs to improve knowledge, reduce strains and enhance the coping patterns of the family care givers having autistic children.

Keywords: Autism, knowledge, strain, coping patterns, family caregivers, children, pediatric nurse.

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I. Introduction

Globally, autistic children represent a vulnerable group since they are subjected to stigma and discrimination, as well as being deprived from health and education services, and not being engaged in the community or having adequate access to services and supportive agencies. In addition to emotional, economic and care burdens faced by their caregivers. There is also a call to engage in certain activities to promote awareness about autism among healthcare workers and caregivers of autistic children in Africa to recognize them early and consequently provide prompt intervention, thus, have better prognosis. As Most caregivers know little about autism and its implications (Hockenberry and Welson, 2013 and World Health Organization (WHO), 2013).

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5, 2013), reported autism, Asperger's syndrome, childhood disintegrative disorder and pervasive developmental disorder not otherwise specified (PDD-NOS), all to be a single disorder with different levels of development under the name of Autism Spectrum Disorder (ASD). ASD is characterized by deficiency in social communication and interaction on one domain and abnormal behaviours, interests & activities on another domain (The American Psychiatric Association, 2013).

In March (2014), the Centre for Diseases Control and Prevention (CDC) issued the autism prevalence report which concluded that about 1% overall the world are autistic. In the United States, autism occurs in one per 68 births. More than 3.5 million Americans are autistic, with autism more common among

boys than girls (5:1); where one boy is affected in every 42 boys, and one girl is affected in every 189 girls (Buescher et al., 2014 and CDC, 2014). In Egypt, the prevalence rate of autism as reported by the study of Haffiz, (2007), is one child in every 870 children, with more than 140,000 children being autistic.

The strains faced by the caregivers of the autistic children may lead them to physical and/or psychological problems and even morbid levels of strain. Many physical complaints are aggregated by strain such as: getting sick more often and feeling emotional, mental and physical exhaustion, pain, auto-immune and heart diseases, problems either in digestion, sleep or weight and skin abnormalities such as eczema. While psychological problems exacerbated by stress/strain include: withdrawal from family and friends, loss of interest in activities previously interested or enjoyed in, feeling irritable, frustrated and depressed (Abdullah, 2014).

The family caregivers of autistic children who do not adopt healthy coping strategies are at high risk for reaction in destructive ways to the stressful events, demoralization, depression and grief, leading to physical disorders and burnout. Until now, no cure for autism was determined. However, research has proved that early intervention improves the autistic children's development and enables them to learn important skills such as talking, walking and interacting with others (CDC, 2014).

The pediatric nurse must give the caregivers of autistic children complete necessary correct information regarding autism, coordinate to meet their needs. The pediatric nurse must teach the caregivers of autistic children how to provide care for their children without or with little strain, provide them with psychological support, help them identify the factors mediating positive coping patterns (Wallace, 2010).

Significance of the study:

The ASDs account for 0.3% of all disabilities-adjusted life years (WHO, 2013). Autism is a lifelong disability which imposes huge emotional and financial burdens. Furthermore, the costs for raising an autistic child are three times more than those for a typically-developing child. Caregivers of autistic children suffer from inadequate access to services and support. Worldwide, most autistic children and their family caregivers do not receive any care from health or social care systems (Scheffer et al., 2012). In Africa, studies are required to increase the awareness of the professional personnel and the caregivers of autistic children regarding autism, its consequent strain and coping. The chances of having a second autistic child among parents already having an autistic child is 2-18% (CDC, 2015).

Based on the previously discussed data, an educational program was developed to assess the actual needs of mothers of autistic children to improve their knowledge, reduce the strains they face and help them to cope positively with their autistic children.

II. Aim of the study

The aim of the present study was to assess the effect of an educational program on the knowledge, strains and coping patterns of the family caregivers of autistic children. This was attained through the following objectives:

- Assessing the knowledge of the family caregivers of autistic children regarding autism.
- Assessing the strains facing the family caregivers of autistic children.
- Assessing the coping patterns of the family caregivers of autistic children.
- Designing, implementing and evaluating an educational program based on the actual needs' assessment of the studied family caregivers of autistic children.

III. Subjects & Methods

Research design:

A quasi-experimental research design was utilized for the current study.

Setting of the study:

The present study was conducted at the available established settings providing care to the autistic children in Ismailia city, namely: Children & Adolescent Psychiatric Outpatient Clinic in Suez Canal University Hospital (SCUH), Wyana Institution for Integration & Rehabilitation of Children with Special needs, The Psychiatric Measures Clinic, El-Aml Center for Children with Special Needs, El-Tathkief El-Fekri Institution, El-Terbia El-Fekria, Gamal El-Din El-Afghani, El-Salam El-Engelia and Ard El-Mashtl Primary Schools.

Subjects:

This study comprised convenient sample of all caregivers of autistic children (36 caregivers and 36 autistic children) under the following **inclusion criteria**:

1. Family caregivers (mothers) of autistic children, regardless their age, level of education and residence.
2. Children aged between 3-18 years old with confirmed diagnosis of autism, from both genders.

Exclusion criteria:

Family caregivers (mothers) having any chronic or psychiatric illness.

Tools of data collection:

Three tools of data collection were used as the following:

Tool I: Structured Interview Questionnaire Sheet: This was designed by the researcher and composed of three parts including; Data regarding the studied care givers, Data regarding the studied children and the studied care givers' knowledge.

Scoring system of the knowledge of the caregivers was scored as follows: unknown answer was scored (0), incomplete correct answer was scored (1) and complete correct answer was scored (2). For each area of knowledge, the scores of the items were summed-up and the total was divided by the number of items, giving a mean score of this area of knowledge. The scores were converted into a percentage score. The knowledge of the mothers was considered satisfactory if their score was $\geq 65\%$, partially satisfactory if their score was $50\% - < 65\%$ and unsatisfactory if the score was $< 50\%$.

Tool II: Caregiver strain questionnaire-short form (CGSQ-SF):

The CGSQ-SF was developed by Platt (1985), to assess the extent to which caregivers and families of children with emotional and behavioral problems experience additional demands, difficulties and psychological consequences as result of their caregiving role. The CGSQ-SF was adapted by the researcher then validity and reliability were done. The CGSQ-SF assessed a total score of caregiving strain and 2 related but distinct subscales: objective strain (6 items) and subjective internalized strain (4 items), their scores were represented as means.

Scoring system of The CGSQ-SF: the total score was calculated as the sum of 2 subscales. Subscale responses ranged from not at all\ a little (A) to quite abit\ very much (C). The subscalescores ranged from 1:5 and the total score can range from 2:10. The score was classified into low or high. The higher score meant more strain experienced. The CGSQ-SF total score, objective strain subscale and subjective internalized strain subscale were considered low if the scores were $< 50\%$ and high if the scores were $\geq 50\%$.

Tool III: - Brief cope scale:

A brief cope scale was developed by Carver (1997), to assess the family caregivers'\parents' patterns of coping with stress\strain associated with raising autistic children. The brief cope scale was adapted by the researcher and then validity and reliability were done. A brief cope scale consisted of 28 items; with 2 items under each subscale based on strong loadings from previous factor analyses, item clarity and meaningfulness to the patients in a previous study. The responses ranged from: I have not been doing this at all (1); to I have been doing this a lot (4).

Scoring system of the A brief cope scale: the total score was obtained by summing up the scores of each pattern. The higher summed scores indicated greater use of the coping pattern. For each area of coping, the summed scores were divided by the number of items, giving a mean score of the part. Standard deviations were computed. The scores were converted into a percentage score. The coping pattern of the caregivers of autistic children was considered low if the score was $< 50\%$ and high if the percent score was $\geq 50\%$.

Pilot study: A pilot study was carried out after the development of the study tools and before starting the data collection. This study included 10% (4 caregivers) of the expected sample size to test the clarity, applicability, efficiency and validity of the study tools and to estimate the required time to gather data. Afterwards, minor changes (item modifications, omissions and additions) were done and the final form was developed. All participants in the pilot study were excluded later from the study sample.

Content validity of the tools: Content validity of data collection were revised by seven expert professors, as juries to test the tools' validity.

Reliability of the tools: Furthermore, the reliability of tools was assessed with the following results:

Scale	Cronbach alpha value
Brief Cope scale	
Positive coping pattern	0.7
Negative coping pattern	0.7
Strain Questionnaire-Short Form (CGSQ-SF)	0.8

Field of the work: The actual field work was carried out over a period of six months. The researcher interviewed each caregiver of an autistic child individually using the previously mentioned study tools for 15-20 minutes according to their physical and mental readiness. Regarding the data collection: the researcher rotated in each study setting as follows: El-Aml Center, Saturday and Wednesday from 2:00 PM to 7:00 PM; Children and Adolescent Psychiatric Outpatient Clinic in Suez Canal University Hospital (SCUH): Sunday from 8:30 AM to 2:00 PM; and for the remaining study settings, the researcher rotated for the rest of the week from 8:30 AM to 2:00 PM.

The planning phase included determining learning objectives of the program and each session, assessment of the educational needs of the studied caregivers, designing the educational program in the light of relevant references and the actual needs' assessment and deciding suitable teaching methods and media.

The implementation phase; The educational program was given in 9 sessions (7 theoretical sessions and 2 practical sessions); time of each session was about 45 minutes (20 minutes then 5 minutes break then 20 minutes) for theory, and about 60 minutes for practice (25 minutes then 10 minutes break then 25 minutes).

Thirty six family caregivers of autistic children were the target population of the educational program. Most of the studied caregivers attended the educational program while their autistic children were in their institutions, however the minority of the studied caregivers accompanied their autistic children; the children attending the program were hyperactive which could interrupt the program, so repetition was the solution when children caused distraction.

The sessions of the educational program were carried out. The first session was an introductory session about the aim and content of the educational program. The second to the fourth sessions were regarding to autism (definition, clinical manifestations, etiologies, treatment methods, needs and problems of the autistic children).

The fifth session was regarding the concept of strain (definition, sources and the strategies of overcoming). While the sixth session up to the eighth sessions were regarding the concept of coping (definition, factors affecting, coping patterns, relaxation techniques and teaching positive ways for adopting positive coping).

The ninth session was conclusion of the educational objectives. Application of the educational program was concept of flexible, depending on the needs of the caregivers. At the end of each session; summary, feedback and further clarifications were done for vague items. Teaching\learning methods were used in the program included audiovisual materials

The evaluation phase; the caregivers were evaluated post the program implementation within two weeks depending on the needs of the studied caregivers. Any missed answers either in the pre- or the post-test were filled by the researcher after contacting the study subjects on the phone.

Ethical consideration: An Official permission was obtained from the director of each study setting. Written consent was taken from each mother prior to her participation in the study after simple explanation of the aim and expected outcomes of the study. The researcher assured voluntary participation, anonymity and confidentiality of the collected information. The caregivers had the right to withdraw from the study any time. All rights and safety of the studied children and their caregivers were secured.

Statistical Analysis:

The collected data were organized, revised, coded, and entered to statistical package of social science (SPSS) program version (18), tabulated, analyzed and interpreted using number and percentage distribution. The following statistical measures: descriptive statistics (including frequency, distribution, mean score degree and standard deviation to describe different characteristics) and Kolmogorov – Smirnov test to examine the normality of data distribution were used.

Univariate analyses (including: t-test and ANOVA test) were also used to test the significance of results of quantitative variables. Mac-Nemar test and Marginal Homogeneity test were used to test the significance of results of paired qualitative variables. The significance level was set at $p < 0.05$.

Limitations of the study: From the studied caregivers, 12 were pretested only and the researcher can't meet with them again, as they stopped visiting the study setting and their telephone numbers were changed, which obligated the researcher to replace them with another 12 caregivers from the newly established Suez Canal Authority Center for Care of Children with Special Needs.

Regarding application of the post-test: the researcher found difficulty to apply the educational program in several study settings with different working times, so the researcher collected the data (post-test) in another setting (the medical profession syndicate club) according to the caregivers' suitable times.

IV. Results

Table (1): Distribution of the studied family caregivers according to their characteristics (n= 36).

Characteristics:	No.	%
Age of mother (in years):		
<35	16	44.4
35 - <40	10	27.8
40 - <45	6	16.7
≥ 45	4	11.1
$\bar{X} \pm SD$	36.7 ± 6.0	
Level of education:		
Elementary\Basic	4	11.1
Less than university	13	36.1
University or higher	19	52.8
Occupation:		
Worker	16	44.4
Housewives	20	55.6
Current marital status:		
Married	34	94.4
Widowed	1	2.8
Divorced	1	2.8

Table (1) represents distribution of the studied family caregivers according to their characteristics. It's clear that less than half (44.4%) of the studied mothers' age is < 35 years old, with mean age of 36.7 ± 6.0 years. In relation to the studied mother's education, it reveals that more than half (52.8%) of the studied mothers have university and post-graduate education. Regarding the studied caregivers' occupation and marital status, it's found that more than half (55.6%) of the studied mothers are housewives and the majority (94.4%) are married.

Table (2): Percentage distribution of the studied caregivers' knowledge (complete correct answers) regarding autism, strains and coping pre/post-program (n= 36)

Complete correct answer about:	Pre-program		Post-program		P
	no.	%	no.	%	
Autism:					
<i>Definition of autism</i>	15	41.7	28	77.8	0.001*
<i>Risk factors of autism related to:</i>					
parents	2	5.6	23	63.9	0.000*
Pre-natal	0	0.0	21	58.3	0.000*
Perinatal	1	2.8	23	63.9	0.000*
Post-natal	2	5.6	24	66.7	0.000*
<i>Clinical manifestations of autism regarding:</i>					
Social communication\interaction	13	36.1	31	86.1	0.000*
Verbal and non-verbal communication	13	36.1	33	91.7	0.000*
Behaviors (activities, concerns and games)	13	36.1	30	83.3	0.000*
<i>Needs of autistic children</i>	29	80.6	35	97.2	0.055
<i>Treatment methods of autistic children</i>	15	41.7	26	72.2	0.033*
Strains:					
<i>Definition of strain</i>	13	36.1	23	63.9	0.018*
<i>Sources of strains</i>	14	38.9	35	97.2	0.000*
<i>Warning signs and symptoms of strain:</i>					
Physical signs and symptoms	11	30.6	28	77.8	0.000*
Psychological signs and symptoms	18	50.0	34	94.4	0.000*
Coping:					
<i>Definition of coping</i>	14	38.9	30	83.4	0.000*
<i>Patterns of coping</i>	20	55.6	31	86.1	0.004*
<i>Factors affecting coping with strains</i>	6	16.7	27	75.0	0.000*

*Statistically significant difference, (P-value of McNemar's test of significance).

Table (2) shows that there is a statistically significant difference of the studied caregivers' knowledge (complete correct answers) regarding autism in relation to (definition, risk factors, clinical manifestations, needs of autistic children and treatment methods), strains/stressors in relation to (definition, sources and warning signs & symptoms) and coping in relation to (definition, patterns and factors affecting coping with strains) pre/post-program (P<0.05).

Table (3): Percentage distribution of the studied caregivers' total knowledge scores regarding autism, strains and coping pre/post-program (n= 36).

Total knowledge about:	Pre-program			Post-program			MH χ^2	P
	Unsatisfactory (< 50%)	Partially satisfactory (50% -< 65%)	Satisfactory (\geq 65%)	Unsatisfactory (< 50%)	Partially satisfactory (50% -< 65%)	Satisfactory (\geq 65%)		
	%	%	%	%	%	%		
Autism	41.7	36.1	22.2	5.6	11.1	83.3	27.4	<0.000*
Strains	38.9	25.0	36.1	0.0	11.1	88.9	23.9	<0.000*
Coping	22.2	19.4	58.3	0.0	2.8	97.2	16.0	<0.000*
Total	44.4	22.2	33.3	0.0	13.9	86.1	25.0	<0.000*

*Statistically significant difference. MH χ^2 : Marginal Homogeneity test.

Table (3) and Figure (1) shows that 41.7%, 38.9%, 22.2% and 44.4% of the studied caregivers have unsatisfactory knowledge regarding autism, strains\stressors, coping and total knowledge scores pre-program, respectively. While post-program, 83.3%, 88.9%, 97.2% and 86.1% have satisfactory knowledge regarding autism, strains\stressors, coping and total knowledge scores respectively with a statistically significant difference(P= 0.000).

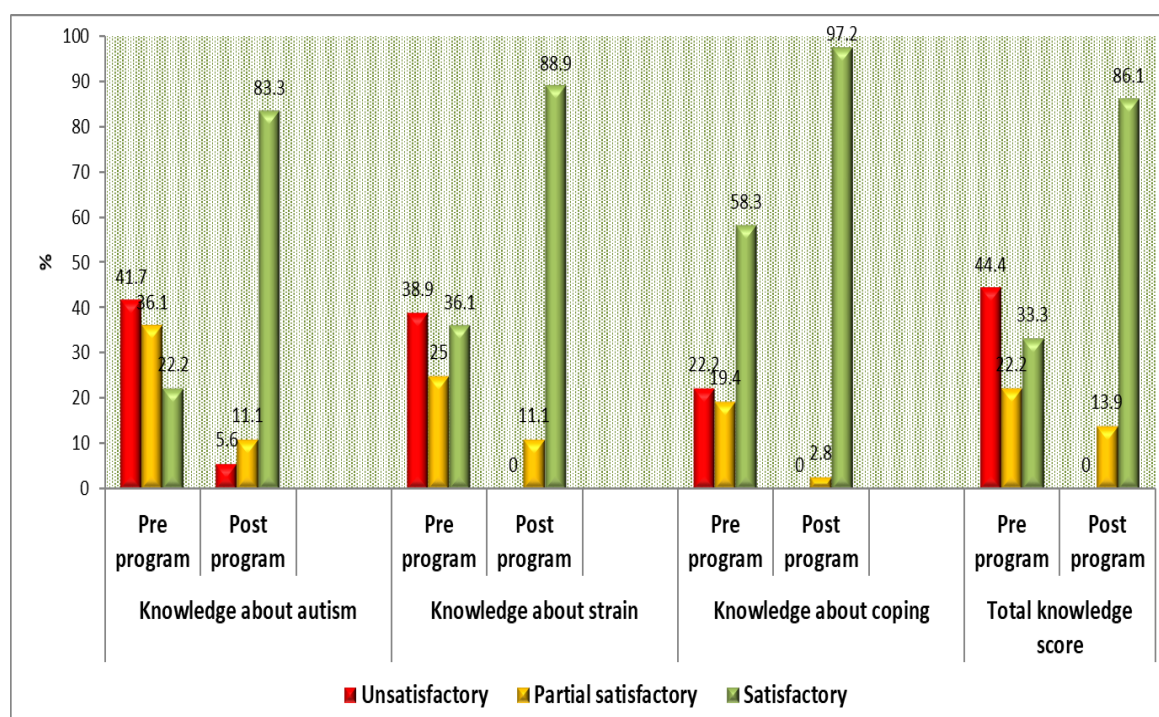


Figure (1): Distribution of the studied caregivers' total knowledge scores regarding autism, strains\stressors and coping pre/post-program (n= 36).

Table (4): Percentage distribution of the studied caregivers' objective and subjective strains due to their autistic children's problems pre/post-program (n=36).

Objective and subjective studied caregivers' strains:	Pre-program			Post-program			Test ^{MH} X ²	P
	A	B	C	A	B	C		
Objectivestrain:								
Missing work or neglecting other duties	66.7	19.4	13.9	52.8	19.4	27.8	2.25	0.325
Disruption\upset within familial relationships	47.2	22.2	30.6	38.9	22.2	38.9	0.65	0.722
Disruption of family routines	44.4	30.6	25.0	33.3	30.6	36.1	1.30	0.522
Interruption of personal time	33.4	19.4	47.2	27.8	22.2	50.0	0.280	0.871
Financial strain for family	27.8	22.2	50.0	27.8	22.2	50.0	0.0	1.0
Family member neglects self financially tocover the autistic child's needs	22.2	27.8	50.0	25.0	19.4	55.6	0.69	0.707
Total percentage of studied caregivers' objectivestrain:	%			%			^{Mac N} X ²	0.306
Low (< 50)	36.1			25.0			1.047	
High (≥ 50)	63.9			75.0				
Subjective strain:								
Guilt felt	36.1	16.7	47.2	36.1	16.7	47.2	0.0	1.0
Tiredness or strain felt	19.4	16.7	63.9	8.3	27.8	63.9	2.60	0.273
Sadness or unhappiness felt	13.9	8.3	77.8	16.7	16.7	66.6	1.400	0.497
Worry felt about the autistic child's future	0.0	5.6	94.4	2.8	13.9	83.3	2.54	0.281
Total percentage of studied caregivers' subjectivestrain:	%			%			^{Mac N} X ²	0.614
Low (< 50)	2.8			8.3			1.059	
High (≥ 50)	97.2			91.7				
Total of percentage of studied caregivers' both objective& subjectivestrain:	%			%			^{Mac N} X ²	0.206
Low (< 50)	22.2			11.1			1.600	
High (≥ 50)	77.8			88.9				

*Statistical significant difference. ^{MH}X²: Marginal Homogeneity test. ^{Mac N}X²: Mac Nemar's test
 A= Not at all\ a little, B=Somewhat, C= Quite a bit\very much.

Table (4) shows that the highest percentages of the studied family caregivers report objective and subjective strains like: interruption of personal time, financial strain for family, neglecting themselves financially, feelings of guilt, tiredness or strain, sadness or unhappiness and worry about the autistic child's future, quite a bit\very much pre-program (47.2%, 50%, 50%, 47.2%, 63.9%, 77.8% and 94.4% respectively) versus 50%, 50%, 55.6%, 47.2%, 63.9%, 66.6% and 83.3% respectively post-program with no statistically significant difference (P > 0.05).

Table (4) also clarifies that the studied family caregivers' total objective, subjective strains and the total of both of them are high pre- (63.9%, 97.2% and 77.8%) respectively and post-program (75.0%, 91.7% and 88.9%) respectively with no statistically significant difference (P > 0.05).

Table (5): Percentage distribution of the studied family caregivers' coping patterns pre\post-program (n=36).

Coping patterns of the studied family caregivers:	Pre-program				Post-program				^{MH} X ²	P
	A	B	C	D	A	B	C	D		

Effect of an Educational Program on Knowledge, Strains and Coping Patterns of the Family Care

	%	%	%	%	%	%	%	%		
Positive coping patterns:										
Active coping	2.8	8.4	19.4	69.4	0.0	2.8	33.3	63.9	3.399	0.300
Planning	5.6	19.4	25.0	50.0	2.8	11.1	36.1	50.0	1.879	0.589
Positive reframing	2.8	8.3	27.8	61.1	2.8	8.4	19.4	69.4	0.721	0.926
Acceptance	8.3	5.6	36.1	50.0	0.0	5.6	19.4	75.0	6.600	0.083
Humor	77.8	11	5.6	5.6	63.9	11.1	5.6	19.4	3.268	0.381
Religion	0.0	5.6	13.9	80.5	0.0	0.0	13.9	86.1	2.076	0.543
Use of emotional support	8.2	8.2	30.6	55.6	11.1	11.1	16.7	61.1	2.375	0.543
Use of instrumental support	2.8	2.8	11.1	63.9	2.8	8.3	22.2	66.7	3.627	0.300
Venting	33.3	33.3	30.6	13.9	22.2	27.8	25.0	25.0	2.365	0.527
Negative coping patterns:										
Self-distraction	33.3	22.2	16.7	27.8	19.4	22.2	33.3	25.1	3.368	0.360
Denial	86.1	8.3	5.6	0.0	75.0	13.9	8.3	2.8	1.976	0.590
Substance use	97.2	0.0	0.0	2.8	94.4	0.0	0.0	5.6	0.348	1.0
Behavioral disengagement	83.3	5.6	8.3	2.8	77.8	11.1	8.3	2.8	0.736	0.947
Self-blame	33.3	30.6	13.9	22.2	36.1	16.7	16.7	30.6	2.075	0.593
Total percentage coping score	%				%				^{Mac} N ^X ²	
Low (< 50)	2.8				8.3				1.059	0.614
High (≥ 50)	97.2				91.7					

MH^X²: Marginal Homogeneity test. ^{Mac}N^X²: Mac Nemar's test. A= Not at all, B= a little, C=Medium and D= a lot.

Table (5) shows that the highest percentages of the studied family caregivers adopt a lot of the following positive coping patterns; active coping, the use of emotional & instrumental support and planning, positive reframing, acceptance religion, pre-and post-program with no statistically significant difference (P > 0.05). The highest percentages of the studied caregivers don't adopt denial, substance use and behavioral disengagement or self-blame as negative coping patterns at all pre- and post-program with no statistically significant difference (P > 0.05). Also the same table shows that the majority (97.2% and 91.7%) of the studied family caregivers has high total coping scores pre- and post-program respectively with no statistically significant differences (P > 0.05).

Table (6): Relationship between total mean scores of knowledge, strains and coping of the studied family caregivers and their characteristics pre/post-implementation of the educational program (n=36).

Characteristics:	Strain Mean Score				Coping Mean Score			
	Pre-program		Post-program		Pre-program		Post-program	
	$\bar{X} \pm SD$	Statistical significance test \P	$\bar{X} \pm SD$	Statistical significance test \P	$\bar{X} \pm SD$	Statistical significance test \P	$\bar{X} \pm SD$	Statistical significance test \P
Age (years):								
<35 (n=16)	70.0 ± 17.9		69.3 ± 15.6		63.8 ± 5.6		66.7 ± 6.0	
35 - <40 (n=10)	62.8 ± 15.8	F= 1.015	68.0 ± 18.2	F=1.029	63.9 ± 6.8	F= 0.103	70.9 ± 11.7	F=0.810
40 - <45 (n=6)	64.3 ± 17.7	P= 0.399	80.0 ± 6.3	P=0.393	62.3 ± 6.7	P= 0.958	65.9 ± 6.1	P=0.498
≥ 45 (n=4)	7.85 ± 11.1		66.0 ± 13.2		63.5 ± 3.5		69.7 ± 4.5	
Level of education:								
Elementary (n=4)	69.0 ± 22.0	F= 0.016	80.0 ± 16.3	F=2.149	62.5 ± 7.8	F= 0.070	65.6 ± 4.4	F=0.229
Less than university (n=13)	67.4 ± 19.4	P= 0.984	64.3 ± 10.4	P=0.133	63.7 ± 5.2	P= 0.933	68.0 ± 7.3	P=0.797
University or higher (n=19)	68.2 ± 14.7		72.4 ± 16.7		63.7 ± 6.0		68.6 ± 8.9	
Occupation:								
Worker (n=16)	60.3 ± 17.9	t= 2.690	71.0 ± 16.6	t=0.233	62.6 ± 5.2	t= 0.856	69.4 ± 10.4	t=0.803
Housewives (n=20)	74.2 ± 13.2	P= .011*	69.8 ± 14.4	P=0.818	64.3 ± 6.2	P= 0.398	67.1 ± 5.2	P=0.431

*Significant at P ≤ 0.05.

Table (6) shows that there was a statistically significant difference regarding the studied caregivers' total strain score and their occupation pre/post-implementation of the educational program (P > 0.05). The housewives are more strained than the working mothers with mean score 74.2 ± 13.2.

Table (7): Correlation between knowledge, strains and coping total mean scores among the studied caregivers pre/post-implementation of the educational program (n=36).

Items:	Total Strain Mean Score	Total Coping Mean Score
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	Pre-program		Post-program		Pre-program		Post-program	
	r	P	r	P	r	P	r	P
Knowledge score	0.159	0.355	- 0.156	0.363	0.146	0.394	0.239	0.160
Strain score	-	-	-	-	- 0.163	0.341	0.236	0.165
Coping score	- 0.163	0.341	0.236	0.165	-	-	-	-

r: Pearson's correlation coefficient. – No correlation.

Table (7) shows that there was a positive correlation between the studied caregivers' total mean scores of knowledge and strain pre-program; while post-program, there is a negative correlation with no statistically significant difference pre/post-program ($P > 0.05$). Also, there was a positive correlation between the studied caregivers' total mean scores of knowledge and coping pre- and post-program ($r=0.146$ and 0.239 respectively) with no statistically significant difference ($P > 0.05$).

It's clear that there is a negative correlation between the studied caregivers' total mean scores of coping and strain pre-program; while post-program, there is a positive correlation ($r= - 0.163$ and 0.236 respectively) with no statistically significant difference pre/post-program, ($P > 0.05$).

V. Discussion

The caregivers of autistic children may feel anger, frustration and depression because of their children's disability and differences. Such caregivers are in need for accurate information, training and being aware of all aspects of their children's disability, in addition to exchanging information and experiences with others having similar problems. Providing care for autistic children without or with little strains and adopting positive coping patterns to cope with autism is necessary for the caregivers of autistic children (Abdullah, 2014).

The studied family caregivers according to their characteristics. It was found that the mean age of the studied mothers was 36.7 ± 6.0 years. More than half of the studied mothers had university and post-graduate education. More than half of the studied mothers were housewives and the majority were married (Table 1). The results of the current study contradicted with Idring et al., (2014) who reported that low educational level of father/mother, as the highly educated parents the more aware and focused in their children characteristics, needs and problems. The current study results showed that there was a statistically significant difference of the studied caregivers' knowledge (complete correct answers) regarding autism in relation to (definition, risk factors, clinical manifestations, needs of autistic children and treatment methods), strains/stressors in relation to (definition, sources and warning signs & symptoms) and coping in relation to (definition, patterns and factors affecting coping with strains) pre/post-program ($P < 0.05$) Table (2).

The findings of the current study were consistent with Bauomey (2012) and Mohammed (2013), who found a statistically significant difference regarding the definition, clinical manifestations and treatment methods of autism pre- and post-intervention ($P < 0.05$). The findings of the current study (Table 2) came in agreement with Mohammed (2013), who revealed that there was a statistically significant difference regarding the risk factors of autism pre- and post-intervention ($P < 0.05$). However, Bauomey (2012), found no statistically significant difference.

The present study results showed that the studied caregivers had unsatisfactory knowledge regarding autism, strains/stressors, coping and total knowledge scores pre-program. While post-program, the majority had satisfactory knowledge regarding autism, strains/stressors, coping and total knowledge scores respectively with a statistically significant difference ($P= 0.000$) Table (3) and Figure (1). The results of the current study were consistent with the study by Mohammed (2013), who revealed that the majority of family caregivers of autistic children lacked knowledge about autism pre-nursing counseling, while half of them had good knowledge regarding the concept of autism post-nursing counseling, with a statistically significant difference. The increase in the total scores of knowledge post-program may have been due to that the majority of the studied caregivers did not attend any previous training courses related to the concept of autism.

The findings of the current study revealed that worrying about the autistic children's future was ranked as the first source of stressors, some of the studied caregivers reported that their autistic children won't marry, as it was too difficult to carry the responsibility of an autistic child in addition to a spouse and offspring, with possibility/risk of being also autistic, in addition to questioning who would care for their autistic children when the caregivers pass away (Table 4). The findings of the current study was supported by Housain (2014), that significant high levels of stress among the studied caregivers and ranked the sources of stressors as follows: psychological & physiological manifestations, worrying about their children's future, feelings of despair & frustration, cognitive & psychological problems, independence problems, familial & social problems and inability to bear the children's burdens.

Furthermore, the finding of the current study agreed with Bauomey (2012), who found that the majority of the studied the caregivers were stressed about their autistic children's future pre-counseling intervention.

EL-Adal (2012) study entitled "Relationship between the familial strains and social support for parents is having autistic children", contradicted with the current study finding, who found that worrying about the

autistic children's future was the least source of stressors among families of autistic children, this might have been due to the difference between the Egyptian and Saurian cultures.

The findings of the current study revealed that there was minimal reduction in the level of worry about the autistic children's future with no statistically significant difference pre- and post-program ($P > 0.05$) (Table 4), as the researcher asked the caregivers to train other family member to act as an alternative caregiver while they were ill, traveling or even if they passed away. These findings contradicted with Bauomey (2012), who found that there was a highly statistically significant difference regarding strain about autistic children's future post the counseling intervention. This may have been related to that most of the autistic children were independent while performing their daily activities.

The findings of the current study (Table 4) came in agreement with the study of Mohammed (2013), which revealed that most the studied caregivers of autistic children had a sense of incompetence (failure as parents), impaired relation with spouse and restriction of their roles pre-nursing guidance, as their autistic children's care made it difficult for them to return to work or even go out an evening together before the nursing guidance. After application of the nursing guidance, there was an improvement in the sense of incompetence and the impaired relation with spouse, with no statistically significant difference.

The findings of the current study revealed that the highest percentage of the studied caregivers expressed subjective strain in the form of feelings of guilt because of leaving their children frequently alone watching TV pre- and post-program, with no statistically significant difference ($P > 0.05$) (Table 4).

The present study results clarified that the total scores of the objective, subjective and total caregivers' strains were high pre-program (Table 4), which came in line with Lan (2015), who found that total mean scores of the objective, subjective and total caregivers' strains were high. This may have been due to autism being a long-term disorder. Usually, mothers face stressful challenges of raising autistic children and become concerned with their children's communication, education, relationships and the independence of their futures.

The findings of the current study however, contradicted with Mohammed (2013) and Bauomey (2012), who found that the majority of the caregivers of autistic children had high parental pressure pre-nursing guidance\intervention and found significant reduction in the total mean scores of strain levels post-nursing guidance\intervention.

The contradiction may have been due to the difference in the ages of the studied children; where in the Mohammed (2013) study, they were aged from 1.5 up to 10 years old, while in the study of Bauomey (2012), they were aged from 3-5 years, meaning that the studied caregivers hadn't begun to think about their autistic children's education, social interaction with friends, their arousals or high sexual desires, and other problems and stressors. Also, these autistic children were free from any chronic physical or neurological disorders.

The findings of the current study clarified that the strain overall was not significantly reduced, but sometimes fluctuated and became higher after application of the educational program (Table, 4). The fluctuations may have been due to presence of some co-existing factors in the current study, which did not cause significant difference such as financial strain to attend the educational program (fees and transportation), time loss and extra home activities. The majority of parents of autistic children experienced a low level of support from agencies & professionals, poor communication of medical & nursing staff and lack of understanding of parents' needs following the formal diagnosis as mentioned by Serrata (2012).

Most of the fathers of the studied autistic children were against the educational program or generally obscuring the studied mothers from accomplishing their role as caregivers, as reported by the studied care givers (mothers). The studied mothers reported that they hoped that their husbands attended this educational program to convince them with their huge role in changing and promoting their autistic children's communication and condition. This coexisting factor came in agreement with Crias and Flippin (2011), who reported that fathers of autistic children may contribute in changing or promoting their autistic children's social interaction styles by direct talk and symbolic play.

Regarding the coping patterns as adopted by the studied caregivers: the findings of the current study (Table 5), were supported by Bauomey (2012), revealed that there was a highly statistically significant difference between pre- post-counseling intervention regarding adopting acceptance ($P < 0.05$). The researcher viewed this as a strong point, as more acceptance of the autistic children meant more highly provided care and struggle by the caregivers.

The findings of the current study contradicted with the study of Cappadocia et al. (2012), entitled "The relations among the autistic children's behavioral problems and autistic children's parents' mental health, psychological acceptance and empowerment", which included 228 parents of autistic children aged 6-21 years, and reported that the increased autistic children's behavioral problems, resulted in decreased acceptance and consequently, increased parental mental health problems.

The findings of the current study showed that the most used positive coping pattern either pre- or post-program was the religion among the studied caregivers, with no statistically significant difference ($P > 0.05$) (Table 5). This may have been due to that the studied caregivers were in need to get rid of the stressors facing

them, so they asked support from God to strengthen their abilities. These findings were supported by Bauomey (2012), who revealed that there was a highly statistically significant difference between pre- and post-counseling intervention regarding seeking spiritual support.

The findings of the current study showed that the highest percentage of the studied caregivers did not adopt venting at all as a coping pattern pre-program, however it was adopted a lot post-program, with no statistically significant difference ($P > 0.05$) (Table 5). The researcher viewed this as a good point, to use such positive coping pattern a lot post-program although it has not been used at all pre-program, even if there was no statistically significant difference.

The researcher's opinion was supported by that of Carver (2011), who mentioned that figuring out aspects of the problem, changing the way of communication, expressing feelings instead of bottling them up in an open and respectful way is very important. If the negative feelings are not expressed or verbalized, resentment will be built and the situation will remain the same.

The findings of the current study showed that the highest percentage of the studied caregivers did not adopt self-distraction at all as a coping pattern pre-program, however it was adopted by them mostly post-program, with no statistically significant difference ($P > 0.05$) (Table 5). The researcher also viewed this as a good point, to use such positive coping pattern mostly post-program when it has not been used at all pre-program, even with no statistically significant difference.

The findings of the current study contradicted with Bauomey (2012), who revealed that there was a statistically significant difference between pre- and post-counseling intervention ($P < 0.05$) regarding passive appraisal coping\self-distraction.

The findings of the current study showed that the highest percentage of the studied caregivers used instrumental and emotional (social) support a lot as positive coping patterns pre and post-program respectively, with no statistically significant difference ($P > 0.05$) (Table 5). The findings of the current study come in line with Lan (2015), who found that the caregivers of autistic children had moderate level of social support from the family, significant others and friends with total mean scores 3.59 ± 0.67 .

On the other hand, these findings contradicted with Ahmedani and Hock (2012), who found that parents/family caregivers of the autistic children reported poor neighborhood social support, greater aggravation and more difficulty coping.

The findings of the current study showed that the majority of the studied caregivers had high total coping scores pre and post-program respectively; with no statistically significant difference ($P > 0.05$) (Table 5). The studied caregivers were very interested in the educational program and attended all the sessions and were very happy to attend such a program as they complained about being neglected from the research area of autism. The studied caregivers had an urgent need to find out how to deal with their children's diagnosis so, they were motivated to acquire any information regarding this point, especially that more than half of them had university and post-graduate education.

The present study findings revealed that the housewives perceived higher strain than the working mothers (Table 6). This may have been due to that the housewives had no chance for ventilation from the home activities and following-up their autistic children's conditions.

The findings of the current study showed that there was a positive correlation between the studied caregivers' total mean scores of knowledge and strain pre-program; while post-program, there was a negative correlation with no statistically significant difference pre\post-program ($P > 0.05$) Table (7). The findings of the current study were supported by the study of Mohammed (2013), which revealed that there was a positive significant correlation between the total mean scores of knowledge of the caregivers of autistic children and total parental pressure pre-nursing guidance ($r = 0.56$ and 0.54 respectively, $P = 0.001$). While post-program, the findings of the current study revealed that there was a negative correlation ($r = -0.156$) with no statistically significant difference ($P > 0.05$).

VI. Conclusion & Recommendations

In the light of the current study, it can be concluded that the educational program significantly increased the total knowledge mean scores of the studied family caregivers and insignificantly nearly maintained their total coping mean scores. On the other hand, the educational program was insignificantly ineffective in decreasing the total mean scores of the studied caregivers' strains.

The current study recommends the following:

- Regular assessment of and management of strains & coping patterns of autistic children's care givers.
- Facilitating continuous meeting between autistic children's care givers to share their experiences, relieve their stressors...etc.
- Further researches are required involving larger sample size all over Egypt to generalize the results.

-The co-existing factors that increase the strain and limit reduction of strain perceived by the caregivers should be assessed, addressed and handled.

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