

Effect of Intervention program for Mothers of Children with Attention Deficit Hyperactivity Disorder

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Abstract: Little is known about the intervention program which based on educating and training mothers of children with Attention deficit hyperactivity disorder. Although mothers of those children especially may experience stressful and difficult conditions. **Aim:** was to evaluate the effect of an intervention program for mothers of children with attention deficit hyperactivity disorder. **Design:** a quasi-experimental research was used. **Setting:** the psychiatric outpatient clinic at Benha University Hospital and pediatric outpatient clinic at Benha Mental Health Hospital. **Sample:** purposive sample involved (138) mothers with their registered children with ADHD. **Tools:** three tools were used for data collection: I- an interview questionnaire to gather relevant data to the study (characteristics of sample and their knowledge regarding knowledge about ADHD). II : Elcamino Pediatrics Home Version Scale to assess child's behavior adopted from **The Foundation for Medical Practice Education, (2007)** and III- Intervention program. **Results:** There were highly statistical significant differences between mothers' knowledge about attention deficit hyperactive disorders and their children's behavior post program implementation ($p < 0.05$). There was a highly statistically significant difference between mothers' knowledge about ADHD pre and post program ($p < 0.001$). **Conclusion:** The current study concluded that the intervention program was effective in improving mothers' knowledge and children's behavior. **Recommendations:** The study recommended that, a developed program should be applied and repeated again every 6 months in the same study settings and adopted in other similar settings as schools of the studied children with required modifications, and provision of continuing education programs.

Keywords: Attention deficit hyperactivity disorder, Mothers, Knowledge level, Intervention program

Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is a childhood-onset neuro-developmental disorder, which characterized primarily by a persistent pattern of inattention, and/or hyperactivity-impulsivity that interferes with or reduces the quality of social, academic or occupational functioning (**American Psychiatric Association, 2013**). These dysfunctions can lead to behavioral problems at home, school, and social settings. Children with ADHD may have difficulty with learning in school, developing appropriate social skills, managing frustration and aggression (**Pei, 2012**).

The principle characteristics of ADHD are inattention, hyperactivity, and impulsivity. These symptoms appear early in a child's life. Because many normal children may have these symptoms, but at a low level, or the symptoms may be caused by another disorder, it is important that the child receive a thorough examination and appropriate diagnosis by a well qualified professional (**National Institute of Mental Health (NIMH), 2013**).

As with all mental disorders of children, the exact causes of attention deficit disorder (ADHD) are simply unknown at this time. The ADHD appears to be a result of a complex interaction of genetic, environmental and biological factors among children whose mothers smoked during pregnancy. In addition, children whose mothers were exposed to poly-substance use and maternal psychological stress during pregnancy had significantly elevated levels of impulsivity and attention problems contribute to ADHD symptoms in the offspring (**Grohol, 2013**).

The Centers for Disease Control and Prevention (CDC) estimated those children who have been diagnosed with ADHD to be 4.4 million in the age group of (5-17 years), it estimates that 5-10 percent of children have ADHD (**Akinbami et al., 2011**). The estimated national prevalence of ADHD was 8.8 percent among children in a study about Trends in the parent-report of health care provider-diagnosed and medicated attention-deficit/hyperactivity disorder in United States. (**Visser et al., 2013**). In Egypt, a study about the prevalence of ADHD among children from Delta region was 20.4 % (**Al-Haggar et al., 2006**).

The impact of the disorder on the mother is almost as dramatic. So, parenting classes should provide mothers with a clearer understanding of the disorder, symptoms, problems and treatment options. Educational programs are efficient ways to deliver this information. It can reduce the sense of hopelessness and isolation that many mothers experience. Moreover, many parents have a need for emotional support beyond just receiving accurate and detailed educational information (**Foley et al., 2008**).

Professional nurses should discuss with mothers the available services and resources, which children with ADHD can receive for creating the best environment as they become more aware of the diagnosis of ADHD. As caregivers have a huge role and responsibility in helping children, understand and manage their relationship with others to maximize their potential and helping them manage their behavior and adjust to rules and procedures (**Evert, 2009**).

Significance of the Study:

Attention-Deficit/Hyperactivity Disorder appears to be a neurologically heterogeneous disorder (**American Academy of Pediatrics, 2011**). Moreover, it needs a great fund because of the academic and occupational underachievement, conduct problems throughout the lifespan, higher levels of associated substance abuse, motor vehicle accidents, and interpersonal relationship problems (**Mick, 2014**).

The problems associated with ADHD appear in different ways at different ages, as the individual matures and as the environmental requirements for a sustained self-control (**American Academy of Child and Adolescent Psychiatry, 2007**). Furthermore, children are seen as being mentally abnormal, this affects the child and the whole family (**Stanford & Tannock, 2012**). So, this study tried to focus on implementing an intervention program for mothers of children with ADHD and how they try to manage and deal with the child, as this disorder causes disruption for all the family, especially for the mothers who deal with the child on a daily basis.

Subjects and Method:

Aim of the Study:

The aim of this study was to evaluate the effect of an intervention program for mothers of children with attention deficit hyperactivity disorder through:

- 1- Assess knowledge level of the mothers of children with ADHD before and after implementing the intervention program
- 2- Assess behavior of the children with ADHD before and after implementing the intervention program.

Research Hypotheses:

- 1- There is an improvement in the mothers' knowledge about attention deficit hyperactive disorder after implementation of the intervention program.
- 2- There are differences in the children's behavior before and after implementation of the intervention program.
- 3- There is a relationship between mothers' knowledge and children's behavior.

Research Design:

A quasi-experimental design was utilized to meet the aim of the current study.

Research Settings:

The present study was conducted at the psychiatric outpatient clinic at Benha University Hospital and pediatric outpatient clinic at Mental Health Hospital after referral from pediatric outpatient clinic where the cases were diagnosed and followed-up.

Sample:

Total purposive sample of 138 mothers and their children with Attention deficit hyperactivity disorder regardless their characteristics (age, gender, education), they were selected from the previously mentioned settings under the following criteria;

- 1-Mothers with newly diagnosed ADHD children (at least previous 6 months).
- 2-Children free from any other medical or psychiatric problems as mental retardation.
- 3-Willing of the mothers to participate
- 4-Age of children (6-12years).

Tools of Data Collection:

Two tools were used for data collection:

Tool I- An interview questionnaire sheet: It was developed by the researchers after reviewing related literatures (**Chacko et al., 2009; Stanford & Tannock, 2012&Mick, 2014**). It was written in Arabic language and composed of closed ended questions. It was comprised from the following parts:

Part I: Characteristics of the studied mothers and their children, it involved (14) items related to mothers and their children such as; education and occupation, gender, age, rank of child, exposure to trauma or cranial injury, and family history of the disease.....etc.

Part II: Mothers' knowledge toward ADHD before and after implementation of the program. Close ended questions were used. It included knowledge about: definition, causes, signs and symptoms, types, complications, diagnosis, treatment.

Tool II - Elcamino Pediatrics Home Version Scale: it was adopted from **The Foundation for Medical Practice Education (2007)**. It used to assess the areas of child behavior (inattention, hyperactivity, impulsivity) and tested for validity and reliability by alpha test as the result score of the test was good value of 0.7

Tool III: Intervention program was designed in Arabic Language in form of educational program by the researchers based upon the actual needs assessment of mothers and their children. It was also supplemented with information based on review of relevant literatures (nursing textbook, journals and internet resources) about attention deficit hyperactivity disorder and training interventions for Attention Deficit Hyperactivity Disorder (ADHD) in Children. Then the program was reviewed by a panel of experts before its implementation. Administrative approval was obtained

from the Dean of Benha Faculty of Nursing, to the head managers of University Hospital and Mental Health Hospital at Benha city.

Tool Validity:

The tools were revised for content validity by five experts in pediatric nursing, psychiatric health nursing and community health nursing, for clarity, relevance, comprehensiveness, and applicability.

Pilot Study:

After developing the tools, a pilot study was conducted on 10% of the expected sample size (18 child and their mothers). A pilot study was conducted to test clarity & completeness of the study tools and to determine the time required to fill each tool. According to the results of pilot, the needed modification, omissions and/or additions were done. A jury acceptance of the final forms was secured before actual study work and the reliability was assessed in a pilot study by measuring their internal consistency using Cronbach's alpha coefficient method.

Ethical Considerations

The researchers informed the entire study sample about the aim, nature, process and expected outcomes from the study. The subjects were informed that all the gathered data was treated confidentially and information was used only for the research purpose only. The participants have the right to withdraw from the study at any time without any reasons. An oral consent was obtained from the participants.

Field Work:

Data collection was conducted over a period of six months from the beginning of January, 2014 to the end of June, 2014. The researchers were attended to the study settings three days / week. It was during six months. Mothers and their children were divided into 40 small groups each group has 3-4 mothers with their children for about 30 – 45 minutes three times /week for each setting and the total hours of the intervention were 11 hours (6 hours theoretical and 5 hours practical), also home visits were conducted 2 times/week for assessment and evaluation of child's behavior.

. Each group was given the freedom to choose their optimal time for receiving the program whenever they have the time to attend for follow-up. Each participant obtained a copy of the program booklet that included all the knowledge they need. Each session usually started by a summary of what has been taught during the preceding sessions and the objectives of the new one. Giving praise and/or recognition to the interested mothers and their children were used for motivation during program implementation. The actual work started by meeting the mothers throughout the time of their attendance to the hospital. The researchers first introduced themselves to the study subjects and gave them a complete background about the study, its aim, then the pre test format, was distributed in order to collect the required data. The researchers were available for more clarification whenever needed. Then, the content of the program was designed based on actual educational needs assessment of the studied mothers. Consequently, the subject content has been sequenced through theoretical and practical sessions that contained a practical performance to the targeted intervention, from the researcher and a redemonstration from the studied sample.

- Contents of the program were selected to meet children and their mothers' needs and to fit into their interests and level of understanding and its content were; definition of ADHD, causes, signs and symptoms, classification of ADHD, complications, diagnosis, treatment, and role of care mothers.

Methods of teaching: were through a modified lectures, brainstorming, demonstration and re-demonstration and group discussion. Suitable teaching aids were prepared and used especially for the program such as; Booklets with pictures were distributed as teaching media

The Scoring system:

Scoring system for the mothers' knowledge level was calculated for each item as follows: complete and correct answer was scored (two points), the incomplete correct answer was scored (one point), while don't know or wrong answer was scored (zero point). For each part, the scores of the items were summed up and the total divided by number of the items, giving a mean score for the part. These scores were converted into a percent score were computed. The mothers' knowledge was

considered satisfactory if the percent score is 60% or more and unsatisfactory if scored less than 60%.

Statistical Design:

The collected data were verified prior to computer entry. Statistical analysis was done by using Statistical Package for Social Science (SPSS) Version 11. Data tabulated and analyzed with the suitable statistical methods by using frequency, percentage, Chi square, mean value and standard deviation, Statistical significance was considered at:

- P value > 0.05 not significant
- P value < 0.05 significant
- P value < 0.001 highly significant.

Results:

Table (1): Characteristics of the mothers of children with attention deficit hyperactive disorders (n=138)

Items	N	%
Age in years		
• <20	14	10.2
• 20-<30	67	48.5
• 30<40	49	35.5
• ≥40	8	5.8
Mean ± SD	27.22 ± 6.67	
Gender:		
• Male	10	7.2
• Female	128	92.8
Level of education		
• Basic education	28	20.3
• Secondary education	75	54.3
• University education	35	25.4
Occupation		
• Work	50	36.2
• Not work	88	63.8
Income		
• Insufficient	96	69.6
• Sufficient	42	30.4
Family number		
• 3-4	128	92.8
• 5-7	10	7.2
Residence		
• Rural	100	72.5
• Urban	38	27.5
Smoking		
• Yes	50	36.2

• No	88	63.8
The first diagnosis of ADHD by:		
1-Medical practitioners	138	100.0

Table (1): Represents that, (48.5%) of mothers was age 20-<30 years with mean age was 27.22 ± 6.67 . Concerning their education, more than half of the mothers (54.3%) had secondary education. As regards to occupation, more than two thirds of the mothers (63.8%) not work. Regarding mothers' residence, three quarters of them (75.5%) lived in rural areas. Also, as regards to income more than two thirds (69.6%) had insufficient income. Moreover, the first diagnosis of the ADHD was done by the medical practitioners. Regarding family income it was revealed that more than two thirds of the study subjects 69.6% had insufficient income.

Table (2): Characteristics and past history of the children with ADHD (n=138)

Item	N	%
Age in years		
• 6-<9	82	59.4
• 9-<12	35	25.4
• ≥ 12	21	15.2
Mean \pm SD	8.66 \pm 1.91	
Gender		
• Female	50	36.2
• Male	88	63.8
Rank		
• First	70	50.7
• Second	68	49.3
Exposure to trauma		
• Yes	38	27.5
• No	100	72.5
Family history of disease		
• Yes	18	13.1
• No	120	86.9

This table illustrates that; the mean age of children was 8.66 ± 1.91 years. As regards to gender, two thirds of the children (63.7%) were males. More than half of the children (50.7%) were the first baby. Nearly three quarters of them weren't exposed to trauma (72.5%). Moreover, 86.9 % of the children had no family history of the disease.

Table (3): Distribution of mothers' knowledge about ADHD pre and post program implementation (n=138)

Items	Knowledge												X ²	P
	Pre program						Post program							
	Unknown		Incomplete answer		Complete answer		Unknown		Incomplete answer		Complete answer			
	N	%	N	%	N	%	N	%	N	%	N	%		
Definition	88	63.8	50	36.2	0	0.0	14	10.1	65	47.1	59	42.8	8.96	<0.001
Causes	93	67.4	45	32.6	0	0.0	19	13.8	74	53.6	45	32.6	9.88	<0.001
Types	79	57.2	59	42.8	0	0.0	24	17.4	59	42.8	55	39.8	10.30	<0.001
Signs and symptoms of:														
• Inattention	77	55.8	50	36.2	11	8.0	9	6.5	68	49.3	61	44.2	10.24	<0.001
• Hyperactivity and impulsivity	71	51.4	54	39.1	13	9.5	9	6.5	66	47.8	63	45.7	10.04	<0.001
Complications	77	55.8	51	37.0	10	7.2	11	8.0	76	55.0	51	37.0	9.80	<0.001
Methods of diagnosis														
• Inattention	78	56.5	50	36.2	10	7.2	6	4.3	74	53.6	58	42.0	10.68	<0.001
• Hyperactive	63	45.7	59	42.8	16	11.6	10	7.2	62	44.9	66	47.9	9.33	<0.001
Treatment	76	55.0	51	37.0	11	8.0	15	10.9	57	41.2	66	47.9	10.23	<0.001
Total	86	62.3	52	37.7	0	0.0	11	8.0	74	53.6	53	38.4	10.63	<0.001

Table (3) shows that, there was a highly improvement in mothers' knowledge post program compared with their knowledge pre program implementation in the most table's items related to ADHD ($p < 0.001$). Also this table shows that, the highest percentage of mothers' knowledge was (67.4%, 63.8%, and 62.3%) for unknown knowledge pre program implementation related to causes of ADHD, definition of ADHD and total knowledge respectively. While, post program implementation more than half of them (55.0%) had incomplete answer related to complications of ADHD and (47.9%) had complete answer related to methods of diagnosis of ADHD.

Table (4): Distribution of the studied children behavior with ADHD pre and post program implementation (n=138)

Items	Inattention behavior												X ²	P
	Pre program						Post program							
	Rarely		Sometimes		Usually		Rarely		Sometimes		Usually			
	N	%	N	%	N	%	N	%	N	%	N	%		
1-Fails to give close attention to details	13	9.4	90	65.2	35	25.4	61	44.2	40	29.0	37	28.8	0.01	>0.05
2- Has difficulty sustaining attention on tasks	29	21.0	68	49.3	41	29.7	85	61.6	52	37.7	1	0.7	7.80	<0.001
3- Not seem to listen when spoken to directly	11	8.0	79	57.2	48	34.8	88	63.8	44	31.9	6	4.3	8.80	<0.001
4- Not follow through on instructions and fails to finish school work or duties	17	12.3	80	58.0	41	29.7	88	63.8	50	36.2	0	0.0	9.95	<0.001
5- Has difficulty organizing tasks and activities	18	13.0	74	53.6	46	33.4	84	60.9	53	38.4	1	0.7	9.70	<0.001
6- Avoid dislikes, reluctantly engages in tasks requiring sustained mental effort	14	10.1	70	50.7	54	39.2	79	57.2	57	41.3	2	1.5	9.64	<0.001
7-Loses things necessary for activities	19	13.8	72	52.2	47	34.0	89	64.5	49	35.5	0	0.0	9.69	<0.001
8- Easily distracted by extraneous stimuli	0	0.0	80	58.0	58	42.0	82	59.4	50	36.2	6	4.4	10.15	<0.001
9- Forgetful in daily activities	18	13.0	72	52.2	48	38.8	88	63.8	43	31.2	7	5.1	9.81	<0.001
TOTAL	11	8.0	79	57.2	48	34.8	88	63.8	44	31.9	6	4.3	8.80	<0.001

This table clarifies that, there was a significant progress in children's behavior in post/test compared with their behavior pre program implementation. Also this table shows that, the highest percentage of children with inattention behavior pre program was (65.2%, 58.0% and 58.0%) for sometimes done relate to items of fails to give close attention to details, not follow through on instructions and fails to finish school work or duties and easily distracted by extraneous stimuli respectively. While, the

highest percentage of children inattention behavior post program was (63.8%) for behavior done rarely related to Not seem to listen when spoken to directly, Not follow through on instructions and fails to finish school work or duties, and Forgetful in daily activities. There are highly statistically significant difference between children with attention behavior pre and post program implementation ($p < 0.001$) in all items, except fails to give close attention to details

Table (5): Distribution of the studied children with impulsive and hyperactive behavior disorder pre and post program implementation (n=138)

Item	Impulsive and hyperactive behavior												X ²	P
	Pre program						Post program							
	Rarely		Sometimes		Usually		Rarely		Sometimes		Usually			
	N	%	N	%	N	%	N	%	N	%	N	%		
1- Fidgets with hands or feet or squirms in seat.	27	19.6	59	42.8	52	36.6	85	61.6	49	35.5	4	2.9	7.89	<0.001
2- Leaves seat in classroom or in other situations in which remaining seated is expected.	18	13.0	71	51.5	49	35.5	87	63.0	46	33.4	5	3.6	9.82	<0.001
3- Runs about or climbs excessively in situations in which it is inappropriate	26	18.8	71	51.5	41	29.6	84	60.9	54	39.1	0	0.0	8.31	<0.001
4- Has difficulty playing or engaging in leisure activities quietly.	17	12.3	67	48.6	54	39.1	89	64.5	48	34.8	1	0.7	9.36	<0.001
5- Acts as if "driven by a motor."	26	18.8	40	29.0	72	52.2	77	55.8	46	33.3	15	10.9	9.06	<0.001
6- Talks excessively	0	0.0	88	63.8	50	36.2	75	54.4	58	42.0	5	3.6	10.03	<0.001
7- Blurts out answers before questions have been completed.	0	0.0	80	58.0	58	42.0	92	66.7	46	33.3	0	0.0	9.94	<0.001
8- Has difficulty in waiting turn.	10	7.2	90	65.3	38	27.5	73	52.9	57	41.3	8	5.8	7.38	<0.001
9- Interrupts or intrudes on others.	0	0.0	78	56.6	60	43.5	74	53.6	49	35.5	15	10.9	9.22	<0.001
TOTAL	10	7.2	90	65.3	38	27.5	73	52.9	57	41.3	8	5.8	7.38	<0.001

Table (3) shows that, there was a highly improvement in children with impulsive and hyperactive behavior disorder post program compared with their behavior pre

program implementation in the all items related to ADHD ($p < 0.001$). Also this table shows that the highest percentage of children with impulsive and hyperactive behavior disorder was (63.8% and 58.0%) for behavior sometimes done pre program implementation related to Talks excessively and Blurts out answers before questions have been completed respectively. While, post program implementation the highest percentage was (66.7.0%, 64.5% and 63.0%) for behavior rarely done related to Blurts out answers before questions have been completed, Has difficulty playing or engaging in leisure activities quietly and Leaves seat in classroom or in other situations in which remaining seated is expected.

Table (6): Relation between mothers' knowledge and their characteristics pre program (n=138)

Characteristics of the mothers	Knowledge				X ²	P
	Unsatisfactory		Satisfactory			
	N	%	N	%		
Age						
• <20	12	10.3	2	9.1	56.0	>0.05
• 20-<30	54	46.5	13	59.0		
• 30<40	42	36.2	7	31.9		
• ≥40	8	7.0	0	0.0		
Level of education						
• Basic education	24	20.6	4	18.2	9.10	<0.05
• Secondary	59	50.8	16	72.7		
• University	33	28.4	2	9.1		
Occupation						
• Work	43	62.9	7	31.8	2.58	>0.05
• Not work	73	37.1	15	68.2		
Income						
• Insufficient	76	65.5	20	90.9	6.44	<0.05
• Sufficient	40	34.5	2	9.1		
Family number						
• 3-4	107	92.2	21	9.5	1.06	>0.05
• 5-7	9	7.8	1	4.5		
Residence						

• Rural	84	72.4	16	72.7	1.36	>0.05
• Urban	32	27.6	6	27.3		

This table shows that, there was a statistically significant relation between mothers' knowledge about ADHD and their level of education and income ($p < 0.05$). Also this table shows that, the highest percentage of mother's knowledge was (90.0%, 72.7%, 72.7%, 68.2% and 59.0%) for satisfactory knowledge related to insufficient income, secondary education, living in rural area, not work and age 20-<30 years respectively.

Table (7): Relation between mothers' knowledge about attention deficit hyperactive disorder and children's behavior pre program implementation (n=138)

Children's behavior/ pre program	Mothers' Knowledge				X ²	P
	Unsatisfactory		Satisfactory			
	N	%	N	%		
1-Rarely	22	65.5	5	27.7	0.41	>0.05
2-Sometimes	49	34.5	10	45.5		
3-Usually	45	0.0	8	36.8		

This table manifests that, the highest percentage of children's behavior pre program implementation was 65.5% for done behavior rarely, where their mothers have unsatisfactory knowledge about ADHD. There was no statistically significant difference between mother's knowledge about attention deficit hyperactive disorders and their children's behavior ($p > 0.05$) ;

Table (8): Relation between mothers' knowledge about attention deficit hyperactive disorder and children behavior post program implementation (n=138)

Children's behavior/post program	Mothers' Knowledge				X ²	P
	Satisfactory		Unsatisfactory			
	N	%	N	%		
<ul style="list-style-type: none"> • Rarely • Sometimes • Usually 	20	90.9	76	19.0	6.44	<0.05
	2	9.1	40	42.2		
	0	0.0	0	38.8		

This table indicates that, the highest percentage of children's behavior post program implementation was 90.9% for done behavior rarely, where their mothers have satisfactory knowledge about ADHD. There was statistically significant difference between mother's knowledge about attention deficit hyperactive disorders and their child behavior post implementation of the program (p<0.05).

Discussion:

Attention Deficit Hyperactivity Disorder (ADHD) is a neuro-developmental disorder characterized by high levels of inattention, hyperactivity and impulsivity that are present before the age of seven years, seen in a range of situations, inconsistent with the child's developmental level and causing social or academic impairment (**Zwi et al., 2012**).

The aim of the current study was to evaluate the effect of an intervention program for mothers of children with attention deficit hyperactivity disorder. This aim was achieved through the current study results and the hypotheses were accepted.

Regarding characteristics of children, it was noticed that, the mean age of the studied children was 8.66 ± 1.91 years. This may be due to that the school age is a problematic age where as the behavior and attitude of the affected children are obvious. This is not supported by **Evert, (2009)** who stated in a study about Attention Deficit Hyperactivity Disorder (ADHD) in the schools: alternative interventions for school counselors that, the common age of ADHD in children was 7 years. Moreover, **Faraone et al., (2014)** stated that, from 2 to 11 percent, or more, of children with

ADHA in the school-age children worldwide in a study entitled,. The course and outcome of attention-deficit/hyperactivity disorder. In contrast, **McMaster University Evidence-based Practice Center, (2011)** stated that, ADHD affects children of all ages, and approximately 5 percent of children worldwide show impaired levels of attention and hyperactivity.

As a result yielded by this study, it was found that, two thirds (63.8%) of children were males. This is in accordance with **Pei et al., (2012)** who were mentioned that, boys are three to four times more likely to be diagnosed as girls with ADHD. Also, **Anastopoulos, et al., (2010)**, was noted that, ADHD is diagnosed three times more often in boys than in girls. With respect, the present study was in contrast with **Chu & Reynolds, (2007)**, who mentioned that, females often are diagnosed with (ADHD) more than males in a study about, Occupational therapy for children with attention deficit hyperactivity disorder (ADHD)

Furthermore, it was found that, 72.5% of children weren't exposed to trauma. This was disagreed with **Ministry of Health Malaysia, (2008)**, was found that, children who suffered from traumatic brain injury, developed ADHD later in study entitled, Management of Attention Deficit Hyperactive Disorders in children and adolescents

It was found that, 86.9 % of the children had no family history of the disease. This may be due to ignorance or lack of family knowledge related to the signs and symptoms of the disease. This not agreed with **Fabiano et al., (2010)**, who found that, heritability (genetic factors) was the influence of about 76 percent of the study samples.

As regards to the first diagnosis, the results of the current study revealed that the first diagnosis of the disease was done by the medical practitioners. This may be due to lack of mother' knowledge as they saw their children mature at different rates and are very different in personality, temperament, and energy levels. This is supported by **Bethesda, (2004)** who mentioned that, the diagnosis should be made by a professional in an area with training in ADHD or in the diagnosis of mental disorders. Child psychiatrists and psychologists, developmental/behavioral pediatricians, or behavioral

neurologists are those most often trained in differential diagnosis. Clinical social workers may also have such training.

Regarding family income the current study revealed that, more than two thirds of the study subjects 69.6% had insufficient income. This supported by, **McMaster University Evidence-based Practice Center, (2011)** that, the number of ADHD cases identified has increased over time. Children from lower socioeconomic status (SES) households are diagnosed with ADHD more often than children from higher SES households.

Clearly, the current study findings pointed out that there was an improvement in mothers' knowledge post/test compared with their knowledge pre program implementation related to ADHD definition, signs and symptoms, types, treatment, with a highly statistically significant difference between mother's knowledge about attention deficit hyperactive disorders, pre and post program implementation ($p < 0.001$); their level of knowledge was improved after the intervention program.

The present study revealed that, There was a significantly improvement with a highly statistically significant between mother's knowledge related to ADHD, pre and post program implementation ($p < 0.001$). This is supported by **Jones, (2006)**, who was found that, the immediate in-service intervention group had more knowledge at both time points than waitlist control groups, and all groups generally improved their knowledge from pre to post in-service intervention. This is supported by **Zwi, et al.,(2012)** who mentioned that, families with children who have ADHD parent training may be aimed at improving the parents' understanding of ADHD or increasing their behaviour management skills, or both. Parents may also learn self-management skills aimed at reducing stress and increasing resilience.

The findings of the present study revealed that there was no significant statistical relation between mother's knowledge about attention deficit hyperactive disorders and their children's behavior ($p < 0.05$) pre-program, while after implementation of the

program, it was obvious significant statistical relation between mother's knowledge about attention deficit hyperactive disorders and their children's behavior. This is in accordance with **Zwi et al. (2009)** who were mentioned that, mothers training programs enabling them to manage their children's challenging or ADHD behavior. In addition, **Harazni (2012)**, who stated that, parent training in behavior therapy has successfully changed the behavior of children with ADHD. Programs, offer specific techniques for giving commands, reinforcing adaptive and positive social behavior, and decreasing or eliminating inappropriate behavior. Moreover, **Raghibi et al.,(2014)** stated that parent training and behavioral therapy are effective on controlling behaviors of children with ADHD disorder in a study entitled(Parent training and behaviour therapy on behaviours of children with attention deficit hyperactive disorder).

The findings of the present study revealed that there was a significant statistical relation between mother's knowledge about ADHD and their education and income ($p < 0.05$). This supported by **National Resource Center on ADHD, (2014)** stated that, most mothers need careful teaching and support to learn parenting skills and use them consistently. It is very difficult for mothers to buy a book, learn behavior modification, and implement an effective program on their own. Help from a professional is often necessary.

Moreover, there is no statistically significant relation between mothers' knowledge and their occupation, age, family number and residence ($p > 0.05$). This is not in accordance with **Agency for Healthcare Research and Quality & McMaster University Evidence-based Practice Center, (2011)** who stated that, rural communities experience numerous obstacles in obtaining specialty services including mental health services. Obstacles include; a lack of accessible services, a general scarcity of resources; and absence of human services infrastructure.

Conclusion:

Based on the results of the present study, it was concluded that, the mean age of the studied children was (8.66 ± 1.91) and two thirds (63.7%) of them were males. The level of mothers' knowledge was improved after implementation of the intervention program and consequently improvement in children's behavior.

Recommendations:

Based on results of the present study it recommended that:

- 1-The intervention program should be applied and repeated again every 6 months in the same study settings and adopted in other settings as nursery and schools with required modifications.
- 2-Provision of continuing education programs on regular basis is suggested in order to refresh and update mothers' knowledge,
- 3-Comparing the efficacy of combination treatment with other methods such as bio-feedback techniques and behavioural interventions.
- 4-Further studies should be conducted and the preferences of the family should be taken into consideration and parental training should be offered by trained professionals.

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