

Effect of Evidence Based Practices Guideline Intervention on Daily Living Problems of Children Suffering from Attention Deficit Hyperactivity Disorder and Their Mothers' Stressors

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Abstract: Attention-deficit hyperactivity disorder (ADHD) is the most commonly diagnosed behavioral disorders in children. It is clinically characterized by hyperactivity, impulsivity and inattention. These symptoms often continue into adulthood and may lead to an increase of family conflict, poor occupational performance and academic failures throughout adult life. **Aim:** The aim of the current study was to evaluate the effect of evidence based practices guidelines intervention on daily living problems of children suffering from attention deficit hyperactivity disorder and their mothers' stressors. This aim achieved through; assessing daily living problems of children suffering from ADHD, assessing mothers' knowledge regarding ADHD and their daily stressors experienced by them as a result of having children with ADHD, implementing and disseminating evidence based practices guidelines regarding ADHD for mothers to overcome daily living problems of their children suffering from ADHD and alleviate the mothers' daily stressors. **Design:** A quasi-experimental study was utilized. **Setting:** This study was conducted at Children Out-patient Clinic at the Psychiatric Medical Center affiliated to Ain Shams University Hospitals. **Sample:** The study involved a purposive sample of 40 school age children with ADHD and their accompanying mothers. **Tools:** 1. Pre-designed Questionnaire Format; to assess characteristics of the studied mothers & their children and assess mothers' knowledge regarding ADHD. 2. Connors Parent Questionnaire to assess features of emotional distress, aggressive behaviors, academic difficulties, hyperactivity and impulsivity (daily problems) of children suffering from ADHD as reported by their mothers. 3. Vanderbilt Parent Assessment Scale to assess level of impairment of children with ADHD through their mothers. 4. Disruptive Behavior Stress Inventory to assess mothers' potential stressors experienced as a result of having a child who displays behavioral difficulties. **Results of the current study revealed that** there was improvement in the total mean score of satisfactory mothers' knowledge regarding ADHD post guidelines intervention. Also, there was improvement in total mean score of children's daily living problems as reported by their mothers post guidelines intervention. **Conclusion:** Evidence based practices guidelines intervention has a positive effect on daily living problems of children suffering from ADHD, alleviate mothers' daily stressors and psychological constraints as a result of having child with ADHD. This study recommended that evidence based practices guidelines can be applied more widely for all mothers having children with ADHD as one of the nursing interventions aiming to overcome daily living problems of their children and alleviate level of mothers' stress.

Keywords: Attention Deficit Hyperactivity Disorder, Evidence-Based Nursing Practices, Guidelines, Children, Mothers and Stress.

I. INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neuropsychological disorders in school children and young adults which has neurobiological and brain origins (*Mahone et al., 2011*).

ADHD is chronic disorder that lasts from childhood to adulthood. The studies show that 3 to 5% of children meet ADHD diagnostic criteria. In most cases, this disorder is associated with some problems such as stubbornness, disobedience to parents, behavioral problems and learning failure. Although psychological factors may play a role in this disorder, the role of parents, especially mothers is important in the etiology of this disorder. The mothers of these children are more rigorous or completely abandoning (*Kaplan and Sadocks, 2010*) & (*Weiss & Weiss, 2011*).

ADHD is a highly prevalent, chronic mental disorder affecting millions of children, it is impairing disorder occurring in 3 – 7% of school aged population (*Pouretmad et al., 2010*) and (*Eiraldi et al., 2012*). In Egypt The reported prevalence of ADHD among primary school children ranged between 6.5% and 7.9% (*Farid et al., 2010*) and (*Farahat et al., 2014*).

The disorder occurs more frequently in males than in females, with ranges that vary from 2.5:1 to 5.6:1. In both sexes, the combined subtype is the most frequent, but in the inattentive subtype there appears to be a greater percentage of girls. The average age of onset of the symptoms is between 4 and 5 years old; the children present impulsivity, hyperactivity, disobedience and are more prone to having accidents. Diagnosis in preschool age can be more difficult as the symptoms are typical of the age. The diagnosis is usually made when they start primary education, when problems appear in school performance, the child is easily distracted, talks impulsively, answers before the question ends, and social dysfunction is observed (disadaptive behavior in the classroom, difficulties to accept rules, aggressiveness, interrupting and meddling with everything (*Ministry of Health and Social Policies, 2010*).

Genetic or neurological factors play role in ADHD, a child who has a close relative with ADHD is about five times more likely to have ADHD than children in general. Alcohol or cigarette use during pregnancy and child's exposure to lead may be a cause of ADHD. High activity levels and short attention spans are a normal part of childhood for many children, but for those with ADHD, hyperactivity and inattentiveness are excessive and interfere with daily functioning. Some children with ADHD only have problems with attention and other children only have issues with hyperactivity and impulsivity, while some children have problems with both. Over time, children with ADHD tend to shed some of the over activity and impulsivity, but they often continue to have significant problems with inattention, distraction, and organization (*American Academy of Child and Adolescent Psychiatry and American Psychiatric Association, 2010*)

According to *Moën, (2014)*, families of children with ADHD facing many challenges in the family unit and in society at large, however parents of children with ADHD have problems with child interaction and experience emotional distress, stress and exhaustion. Parent stress can rise sharply when the child does not respond to ordinary parental requests and behavioral advice. The mothers' parenting role and emotional distress have been identified and mothers have described caring for a child with ADHD as demanding and putting restrictions on their social life and time for themselves.

Moreover, inconsistent parental discipline and a low involvement of the fathers have been associated with ADHD and may add more maternal stress, thereby highlighting the need for the involvement of fathers in the treatment of ADHD and in everyday life. Siblings of children with ADHD have reported emotional problems and feeling victimized by their sibling with ADHD (*Steinhausen et al., 2012*).

ADHD begins in childhood and is characterized by attention deficits, hyperactivity, impulsiveness, over activity, instability, poor coordination or disorganization which is not appropriate for a person's age. The effects of ADHD are not limited to the subject alone, but go beyond and can affect their closest social and familiar context, and particularly to parenting practices, especially when children with ADHD present associated behavior problems (*Silva and Urbano, 2016*).

As stated by *Ricardo et al., (2012)*, children with ADHD frequently evidence home- and school-related problems, including disruptive classroom behavior, decreased accuracy on assignments, problems with study skills, difficulty in social interactions, and difficulty following parent and teacher directions, all of which may result in significant impairment at home, school, and in the community

As stated by *Eiraldi et al., (2012)*, children with ADHD frequently experience impairment related to academic performance (e.g., lower achievement test scores, higher rates of grade retention) and social interactions, including strained relationships with parents, siblings, teachers, and peers. Because of challenging classroom behavior (e.g., significant time off-task, frequent rule violations, failure to comply with teacher instructions), teachers often spend a significant amount of time providing supports to children with ADHD, which may result in conflict in the student-teacher relationship. Also, due to behavioral difficulty at home, children with ADHD frequently have stressful and conflicting interactions with their parents, which negatively impact parent-child relationships and parents' ability to support their children's education.

ADHD can interfere with a child's ability to perform in school and capacity to develop and maintain social (peer) relationships. ADHD can increase a child's risk of dropping out of school or having disciplinary problems. As well as, the disorder is associated with an increased risk of having problems with hazardous driving, cigarette smoking, and substance abuse (**American Academy of Child and Adolescent Psychiatry and American Psychiatric Association, 2010**).

Many children with ADHD have very poor sleep patterns, and although they appear not to need much sleep, daytime behavior is often worse when sleep is badly affected. As a result, parents have little time to themselves; whenever the child is awake they have to be watching them. Family relationships may be severely strained and in some cases break down, bringing additional social and financial difficulties. This may cause children to feel sad or even show oppositional or aggressive behavior (*Harpin, 2015*),

As mentioned by *Gau and Chang (2013) & Moghaddam et al.,(2013)*, parent-child interactions are often affected by many factors, including emotional instability, behavioral disturbances, parent-child conflict, and parenting styles. Treating with dysfunctional discipline by parents, worse child treatment outcome could be predicted. Previous studies have shown that children irresponsibility and poor parenting skills may worsen ADHD symptoms.

Harpin, (2015), mentioned that ADHD may affect all aspects of a child's life. Indeed, it impacts not only on the child, but also on parents and siblings, causing disturbances to family and marital functioning. Disrupted parent-child relationships, reduced parenting efficacy, and increased levels of parent stress, particularly when ADHD is comorbid with conduct problems. The adverse effects of ADHD upon children and their families changes from the preschool years to primary school and adolescence, with varying aspects of the disorder being more prominent at different stages. ADHD may persist into adulthood causing disruptions to both professional and personal life. In addition, ADHD has been associated with increased healthcare costs for patients and their family members.

The behavior of children and adolescents with ADHD poses strong challenges for parents in educating them and bringing them up, generating high levels of anxiety and family stress. But family dysfunctions or inadequate parenting styles can also aggravate the symptoms of children with ADHD (*Silva and Urbano, 2016*).

ADHD causes a lot of problems at home, school and social situations. Considering the family and parenting factors in growth and development of ADHD children, the parenting interventions are consider as a primary intervention programs for this children. Parenting management training, based on social learning models, is an effective and practical way for treatment of children with incongruent behavior (*Moghaddam et al., 2013*).

As stated by *Tracey , (2011)*, ADHD cannot be cured. However, education and treatment can assist children to cope and succeed both at home and within other environments. Outcomes for the child will be their best when all of the key players in the child's life, across all contexts, gather an understanding of ADHD and the impact on the child as well as participate in implementing strategies in a consistent manner. Currently, the most effective method of treatment for these children is a multifaceted program, including treatment with methylphenidate and family therapy or behavioral parent training and education programs in schools and teaching coping skills.

According to *Gau and Chang, (2013)* and *Moghaddam et al., (2013)* the most effective method of treatment for these children is a multifaceted program, including treatment with methylphenidate and family therapy or behavioral parent training and education programs in schools and teaching coping skills. In addition, the relationship between the children with ADHD and their parents is a crucial issue. Wrong ways of parenting lead to make harsh and furious reactions. Because ADHD children cause activity, attention, and education problems, their parents interact cruelly with them. Parent-child interactions are often affected by many factors, including emotional instability, behavioral disturbances, parent-child conflict, and parenting styles. Treating with dysfunctional discipline by parents, worse child treatment outcome could be predicted. The children' irresponsibility and poor parenting skills may worsen ADHD symptoms.

As stated by *Ricardo et al., (2012)*, parents can consistently communicate the value of education to their children and establish a home environment that supports learning (i.e., by limiting TV and video game time and providing educational games and materials). Also, parents can increase child involvement in literacy activities and utilize strategies to improve homework performance.

Evidence-Based Nursing Practices (EBNP) is an approach for creating quality decisions and providing nursing intervention based upon personal clinical expertise in combination with the most current, related research available on the topic. EBNP implements the most up to date methods of providing care, which have been proven through appraisal of high quality studies and statistically significant research findings. For proper implementation of EBNP, the knowledge of the nurse, the patient's preferences, and multiple studies of evidence must all be cooperate with each other and utilized in order to produce an appropriate solution to the task at hand (*Melnyk, 2011*). As mentioned by *Karkada, (2015)*, an Evidence-based nursing practice is one approach that may enable nurses to manage the explosion of new literature and technology and ultimately may result in improved patient outcomes.

Significance of the Study:

Attention-deficit hyperactivity disorder (ADHD) is one of the most prevalent psychiatric (neurobiological) disorders in children and adolescents and the most frequent reasons for children being referred to the pediatrician, neuropsychiatrist or to the mental health team, because they present with behavioral problems ADHD may affect all features of a child's life. Indeed, it impacts not only on the child, but also on parents and siblings, causing instabilities to the family (*Abdelkarim, et al., 2015*).

As reported by *Al-Haggar et al., (2011)* In Egypt, a study of the prevalence of ADHD among children from Delta region was 20.4%. In Egypt the prevalence is estimated in school children between 6.5% and 7.9%. According to epidemiological studies, ADHD can be persistent and affect between 35 and 80% of adults with at least one or more symptoms of ADHD (*Abdelkarim, et al., 2015*).

The adverse effects of ADHD upon children and their families changes from the preschool years to primary school and adolescence, with varying aspects of the disorder being more prominent at different stages. ADHD may continue into adulthood causing disruptions to both professional and personal life and it has been associated with increased healthcare costs for patients and their family members (*Harpin, 2015*).

Aim of the Study:

The aim of the current study was to evaluate the effect of evidence based practices guidelines intervention on daily living problems of children suffering from attention deficit hyperactivity disorder and their mothers' stressors.

This aim achieved through the following objectives:

- Assessing daily living problems of children suffering from attention deficit hyperactivity disorder.
- Assessing mothers' knowledge regarding ADHD and their daily stressors experienced by them as a result of having children with ADHD.
- Implementing and disseminating evidence based practices guidelines regarding ADHD for mothers to overcome daily living problems of their children suffering from ADHD and alleviate the mothers' daily stressors.

Hypothesis:

- Evidence based practices guidelines intervention has a positive effect on daily living problems of children suffering from ADHD and their mothers' stressors.

II. SUBJECTS AND METHODS

A. Research Design

A quasi-experimental design was utilized in carrying out the current study.

B. Research Setting

This study was conducted at Children Out-patient Clinic at the Psychiatric Medical Center affiliated to Ain Shams University Hospitals. This setting provides different services such as diagnostic, therapeutic, educational, speech and behavioral therapies for large numbers of children with ADHD.

C. Research Subjects

Sample Size and Characteristics: The study involved a purposive sample that included 40 school age children with ADHD and their accompanying mothers under the following inclusion criteria:-

- Children who were diagnosed with ADHD for at least 3 months at the time of the study.
- Age from 6-12 years.
- Both genders.
- Children free from any physical or other psychological health problems or handicapping.
- Mothers who were free of any psychological disease or problem.
- Mothers and their children who were voluntary willing to participate in the study.

Tools of Data Collection

Data was collected through using the following tools:

I. Pre-designed Questionnaire Format:

It was designed by the researchers in simple Arabic language to assess characteristics of the studied mothers and their children and also assess the mothers' knowledge regarding ADHD. The tool was designed in the form of closed-ended questions. The time taken by each mother to fill in the questionnaire was 15-20 minutes. It consisted of two parts:

Part 1: It was concerned with characteristics of the studied subjects. A. Characteristics of the studied mothers such as; age, level of education, occupation, marital status, number of children in the family, mean of monthly income for the family and parents' consanguinity. **B.** Characteristics of the studied children such as; age, gender, rank, academic year and presence of other siblings suffering from ADHD.

Part 2: Questions to assess mothers' knowledge regarding ADHD (Pre and Posttest). It based on updated related scientific literatures. It included definition, causes, signs & symptoms and treatment of ADHD. Mothers were interviewed individually and the questionnaire format was filled in by the researchers. According to the answers obtained from the mothers, a scoring system was followed to evaluate the mothers' level of knowledge regarding ADHD. The total score for the questionnaire was 50 grades (equal 100%). The studied mothers' answers were cross-checked with a key model answer, and then categorized as satisfactory knowledge ≥ 30 grades (scored 60% and more) or unsatisfactory knowledge < 30 grades (scored less than 60%).

II. Connors Parent Questionnaire (Pre and Posttest). It was adapted from *Connors (2008)* to indicate the degree of child's daily living problems through assessing features of emotional distress, aggressive behaviors, academic difficulties, hyperactivity and impulsivity (daily problems) of children suffering from ADHD as reported by their mothers. It consists of 48 items in an English language and translated by the researchers into Arabic language. Mothers asked to rate their answer on a 4- points rating scale and scored 0-3. Whereas, 0 = Not at all; 1 = Just a little; 2 = Pretty much; 3 = Very much. **Scoring system:** The total score of the questionnaire was 144 grade that divided into 3 categories: mild problems (scored ≤ 48), moderate problems (scored 49 - ≤ 96) and severe problems (scored 97 - ≤ 144).

III. Vanderbilt Parent Assessment Scale (Pre and Posttest)

It was adapted from *American Academy of Pediatrics and National Initiative for Children's Healthcare Quality, (2002)* to assess level of impairment of children with ADHD through their mothers. It consists of 47 items in English language and translated into Arabic language by the researchers. Mothers asked to rate their answer on a 4- points rating scale and scored 0-3. Whereas, 0 = never; 1 = occasionally; 2 = often; 3 = very often. **Scoring system:** The total score was 141 grade that divided into 3 categories: mild impairment (scored ≤ 47), moderate impairment (scored 48 - ≤ 94) and severe impairment (scored 95 - ≤ 141).

IV. Disruptive Behavior Stress Inventory (Pre and Posttest)

It was adapted from *Johnson and Reader, (2001)* to assess mothers' potential stressors that are sometimes experienced as a result of having a child who displays behavioral difficulties. It consists of 40 items in an English language and translated into Arabic language by the researchers. Mothers asked to rate their answer on a 4- points rating scale and scored 0-3.

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Whereas, 0 = not at all stressful; 1 = somewhat stressful; 2 = moderately stressful; 3 = very stressful. **Scoring system:** The total score was 120 grade that divided into 3 categories: mild stress = (scored ≤ 40), moderate stress (scored 41 - ≤ 80) = and severe stress = (scored 81 - ≤ 120).

Guidelines Booklet Construction

Evidence based practices Guidelines Booklet was prepared by the researchers after reviewing of the related literature. It was specially designed in simple Arabic languages for mothers of studied children. The booklet included: Objectives from the booklet, introduction about ADHD, concept of ADHD, causes of ADHD, manifestations and problems of children with ADHD, parents role in caring ADHD children, Evidence based practices guidelines which emphasizing on behavioral parent training, behavioral classroom interventions, behavioral peer interventions and academic interventions. The booklet was also included illustrations and colored figures.

Phases of Study Application

1. Preparatory Phase

After reviewing the past and current regional and international related literature covering all aspects of the study using available books, journals, articles and magazines to get acquainted with the research problem and guide the researchers in questionnaire preparation and also in preparing a booklet in simple Arabic language concerning evidence based practices guidelines for mothers having children suffering from ADHD .

- **Content Validity:**

The tools were ascertained by three experts from pediatric and psychiatric academic nursing staff. Their opinions were elicited regarding the tools for clarity, relevance, comprehensiveness and simplicity. Minor modifications were done in the form of omission or rephrasing some statements.

Testing reliability:

The study tools were statistically tested for reliability by Cronbach's alpha test. Internal consistency was measured to identify the extent to which the items of the study tools measured the same concept and correlated with each other. A good internal consistency was detected, where the test value reached 0.91.

2. Exploratory Phase

A. Pilot study

A pilot study was carried out involving 10 % of the expected total study sample (no=4). The results of the data obtained from the pilot study were used to evaluate the clarity, feasibility and applicability of the study tools and determine the time required to fill them. According to the results obtained from the pilot study, necessary modifications were done. The entire sample involved in the pilot study was later excluded from the main study sample.

B. Field work

The actual field work was carried out over a period of 5 months started at May 2017 till the end of September 2017. A period of 20 weeks for data collection and application of evidence based practices guidelines. For each group of 10 mothers, one week for assessment phase (pretest using the study tools), two weeks for implementation phase and one week for evaluation phase (posttest). The researchers were available in the study setting from 9.00 am to 12.00 am for two days/ week to collect data till the sample size reached.

C. Procedures Technique:

I. Assessment Phase (pretest 1st week):

For each group of 10 mothers and their children the researchers conducted an interview session. After giving simple explanation about the nature of the study to the studied subjects, the researchers allocated one week to collect data about the studied subjects by interviewing them individually using the study tools (pretest). The time consumed to fill each tool ranged from 5-10 minutes.

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II. Implementation phase(2nd and 3rd week):

Evidence based practices guidelines given to the children suffering ADHD and their accompanying mothers which implemented through two weeks in four days on eight different sessions.

The first session: During the initial session the researchers explained the aim of the study and discuss the meaning, causes and symptoms of ADHD.

The second session: It was including the diagnosis and different types of medication of ADHD.

The third session: It was concerned with side effects and complications of each medication.

The fourth session: It was concerned with how the mother and her child overcome side effects and complications of medication.

The fifth session: It was concerned with daily living problems of the children suffering from ADHD as problems seriously affect schoolwork or grades, home life or friendships.

The sixth session: It was concerned with tips to overcome daily living problems of children suffering from ADHD. It included evidence-based ADHD intervention which adapted from **Ontario Centre for excellence in child and youth mental health, (2015)**, and highlighted by the researchers in the Arabic booklet through focusing and emphasizing on behavioral parent training, behavioral classroom interventions, behavioral peer interventions and academic interventions.

The seventh session: It was concerned with daily stressors of the mothers having children suffering from ADHD regarding feelings of incompetency, depression, role restriction, relationship with spouse and attachment to the child.

The eighth session: It was concerned with how mothers having children suffering ADHD overcome their daily stressors and giving summarization about the guidelines intervention and its objectives.

III.Evaluation Phase (posttest) (4th week): The researchers allocated one week for each group to evaluate the outcome of the guidelines intervention. The researchers using the same study tools of assessment phase after guidelines intervention (posttest).

Different teaching Methods were used as; group discussion, role play, open discussion, small group activity. **While instructional medias** were in the form of booklet, posters, pictures, real situation, real objects, and computer-assisted education using the researchers' laptop.

Administrative Design:

After explanation of the purpose of the study, the methods of the data collection and the expected outcome of the study, written permission was taken from the authorized persons in the previously mentioned study setting. Also, a clear and simple clarification about the aims and nature of the study was explained to all participant mothers. Then, oral permission with agreement was also obtained from the studied mothers and their children to ensure willingness to participate in the study.

Ethical Consideration

An approval to carry out the study was obtained before initiation of the research from the hospital administration. Mothers and their children were assured that their participation was voluntary; they notified that they can withdraw from the study at any time and the data collected would be used only for the purpose of the study. Confidentiality of the collected data and results was achieved and the study hasn't any harmful effect on them.

Statistical Design: Data were checked for accuracy and completeness, collected, organized, revised, coded, tabulated and analyzed by using the Statistical Package for Social Science (SPSS) version 20. Numerical data were presented as number, percentage, mean and standard deviations. The comparison between quantitative data pre and post application of the guidelines was done by using Chi square (χ^2) and t test. While correlation between mothers' stress and their children impairment was done by using **Spearman correlation coefficients test (r-test)**.

To estimate the statistically significant differences between the different study variables, level of significance was regarded as follow: $P > 0.05$ Non- significant, $P < 0.05$ Significant and $P < 0.01$ Highly- significant.

Limitation of the Study

- Withdrawal of about 7 mothers from the study without any cause and other 11 cases due to the distance between their homes and the Psychiatric Medical Center, which prevented them from completing the study after the third day of the program which forcing the researchers to search for other cases.
- Interruption of some implementations sessions due to meeting with a psychiatrist and conduction of some diagnostic tests with psychologist or to buy some medications from the pharmacy attached to the Psychiatric Medical Center which forcing the researchers to complete those sessions individually with each mother later on.

III. RESULTS

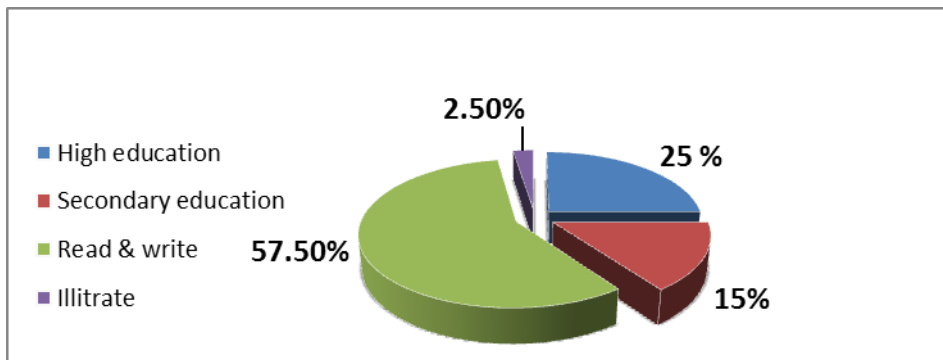
Table (1): Distribution of the Studied Mothers according to Their Characteristics

Mothers' Characteristics	Studied Mothers [No.=40(100%)]	
	No	%
Age(Years)		
20: < 25	4	10.0
25: <30	15	37.5
30: <35	15	37.5
≥35	6	15.0
$\bar{X} \pm SD$	30.3 ± 5.40	
Number of children for the mother		
One	13	32.5
Two	17	42.5
Three	8	20.0
Four and more	2	5
Sources of mothers' knowledge about ADHD		
Psychiatrists or psychologists	*	*
Awareness leaflets	15	37.5
Mass media	13	32.5
Internet	3	7.5
Relatives and friends	4	10.0
Academic education	6	15.0
	5	12.5
Mean of monthly income for the family		
< 1000 EP	3	7.5
1000 ≤ 2000 EP	26	65.0
2000 ≤ 3000 EP	11	27.5
$\bar{X} \pm SD$	1774.75 ± 556.42	

* Total number is not mutually exclusive.

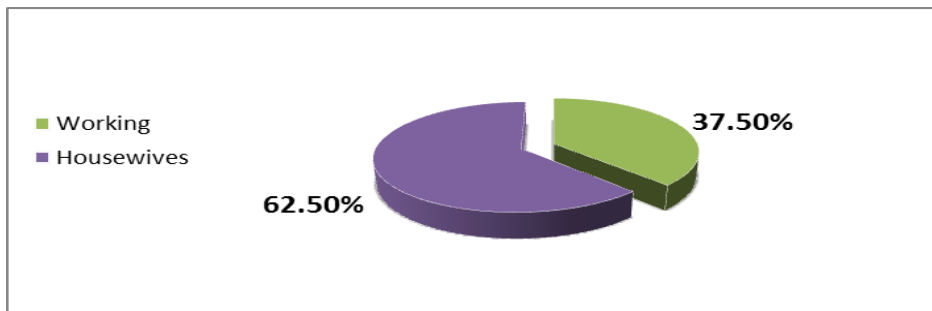
Concerning the characteristics of the studied mothers, table 1 showed that, the mean age of the studied mothers was $\bar{X} \pm SD = 30.3 \pm 5.40$ and more than two fifths (42.5%) of them having two children and nearly one third of them get their knowledge about ADHD through awareness leaflets while the minority (7.5%) of them get their knowledge from mass media.

Figure (1): Percentage Distribution of Studied Mothers according to Their Level of Education.



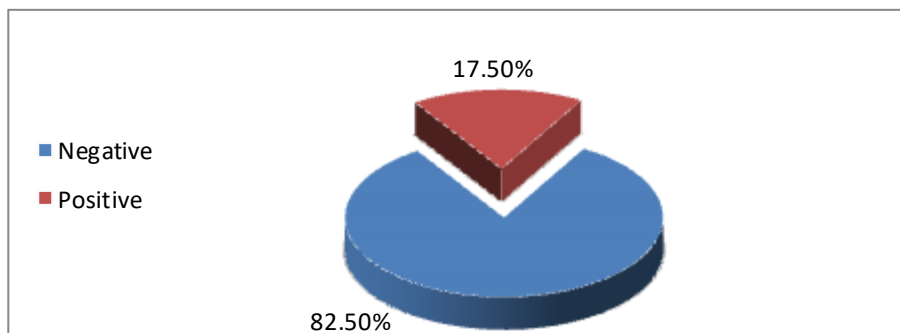
Regarding the studied mothers' level of education, figure 1 illustrated that, more than half (57.5%) of mothers were read and write, while the minority (2.5 %) of them were illiterate.

Figure (2): Percentage Distribution of Studied Mothers according to Their Occupation.



In relation to the studied mothers' occupation, figure 2 clarified that, nearly less than two thirds (62.5%) of them were housewives.

Figure (3): Percentage Distribution of Studied Mothers according to Parents' Consanguinity.



Concerning parents' consanguinity, figure 3 clarified that, more than four fifths (82.5%) of the studied mothers had negative parents' consanguinity.

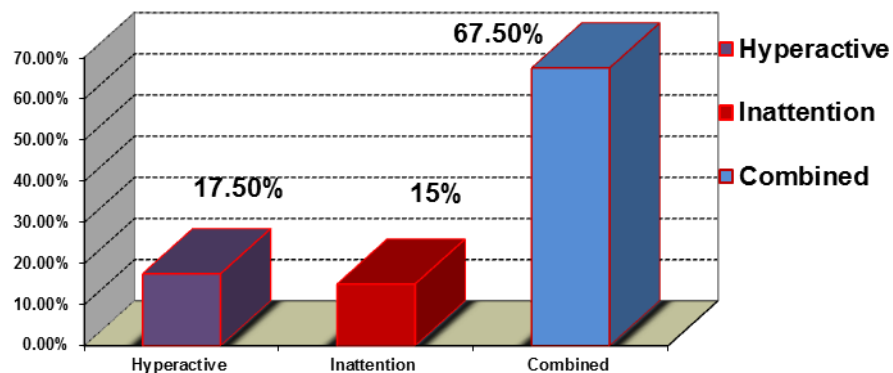
Table (2): Distribution of the Studied Children according to Their Characteristics

Children' Characteristics	Studied Children [No. =40(100%)]	
	No	%
Age(Years)		
6 : < 8	27	67.5
8 : < 10	9	22.5
	4	10.0

10 : ≤ 12		
$\bar{X} \pm SD$	7.10 ± 1.78	
Gender		
Boys	33	82.5
Girls	7	17.5
Child's Ranking		
First	21	52.5
Second	16	40.0
Third	2	5.0
Fourth	1	2.5
Presence of other siblings with ADHD		
Yes	4	10.0
No	36	90.0

As clarified from table 2, nearly two thirds (67.5%) of the studied children, their age ranged from 6 : <8 years with $\bar{X} \pm SD = 7.10 \pm 1.78$ years. As regards their gender, it was found that, more than four fifths (82.5%) of children were boys and more than half (52.5%) of them were ranked as the first children for their mothers and only 10% of children having siblings with ADHD.

Figure (4): Distribution of the Studied Children according to Their Diagnostic Subtypes of ADHD



In relation to the studied children's diagnostic subtypes of ADHD, figure 4 displayed that, more than two thirds (67.5%) of the studied children had combined type of ADHD, while nearly one seventh (15%) of them were diagnosed with inattention subtype of ADHD.

Table (3): Distribution of Satisfactory Mothers' Knowledge Regarding Attention Deficit Hyperactivity Disorder Pre/ Post Guidelines Intervention.

Items of Knowledge	Mothers' Satisfactory Knowledge (≥ 60%)				Test of significance	
	Pre		Post		χ^2	P Value
	No	%	No	%		
Definition of ADHD	6	15.0	23	57.5	15.632	*0.000
Causes of ADHD	5	12.5	19	47.5	11.667	*0.001
Sign & Symptoms of ADHD	40	100	40	100	NA	NA
Treatment of ADHD	7	17.5	22	55.0	12.170	*0.000
Symptoms that indicating inattention	33	82.5	36	90.0	0.949	0.329

Symptoms that indicating hyperactivity of the child	24	60.0	30	75.0	2.051	0.152
Symptoms that indicating impulsivity of the child	7	17.5	21	52.5	10.769	*0.001
Tips for handling of child's daily problems	6	15.0	22	55.0	8.571	*0.003

*P<0.001 = highly statistical significance, P>0.05 = statistical insignificance.

As noticed from table 3, there was a significant improvement in the mothers' knowledge post guidelines intervention regarding definition, causes, treatment of ADHD, symptoms that indicating impulsivity of the child and tips for handling of child's daily problems that indicated highly statistical significant difference.

Table (4): Total Mean Score of Satisfactory Mothers' Knowledge Regarding Attention Deficit Hyperactivity Disorder Pre/ Post Guidelines Intervention

Mothers' Knowledge	Total Mean Score		Test of significance	
	Pre	Post	t-test	P Value
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
Satisfactory Mothers' Knowledge	19.43 ± 4.24	22.73 ± 5.51	4.193	< *0.001

*P<0.001 = highly statistical significance.

As revealed from table 4 there was improvement in the total mean score of satisfactory mothers' knowledge regarding ADHD post guidelines intervention compared to pre guidelines intervention that indicated highly statistical significance difference (P < 0.001).

Table (5): Mean Scores of children' Daily Living Problems as Reported by Their Mothers Pre/ Post Guidelines Intervention.

Children's Daily Problems	Mean Score		Test of significance	
	Pre	Post	t-test	P Value
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
Emotional Problems	20.35± 2.15	15.60 ± 1.58	11.646	0.000
Social Problems	25.90± 1.598	20.1 ±1.39	41.55	0.000
Academic Difficulties	8.875±1.158	7.775±0.92	7.73	0.000
Hyperactivity	17.825±1.985	14.50±2.09	15.187	0.000
Impulsivity	9.975± 1.342	7.857±0.73	7.57	0.000
Inattention	12.41±1.94	9.1±1.42	10.765	0.000

*P<0.001 = highly statistical significance.

As revealed from table 5, there was a clear improvement in mean scores of children's daily living problems as reported by their mothers through using Connors Parent Questionnaire post guidelines intervention compared to pre guidelines intervention that indicated highly statistical significance difference (P = 0.000).

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Table (6): Distribution of The Children's Daily Living Problems as Reported by their Mothers Pre/ Post Guidelines Intervention.

Children's Level of Impairment	Total number of children [No.=40(100%)]				Test of significance	
	Pre		Post		t-test	P Value
	No	%	No	%		
•Mild problems (scored ≤ 48)	3	7.5	4	10	35.905	<0.001
•Moderate problems (scored 49 : ≤ 96)	14	35	25	62.5		
•Severe impairment (scored 97 : ≤ 144)	23	57.5	9	22.5		
Total Mean Score $\bar{X} \pm SD$	95.33 \pm 4.82		74.93 \pm 4.84			

*P<0.001 = highly statistical significance.

As revealed from table 6, there was a clear improvement in the total mean scores of children's daily living problems as reported by their mothers through using Connors Parent Questionnaire post guidelines intervention compared to pre guidelines intervention that indicated highly statistical significance difference (P < 0.001).

Table (7): Distribution of The Children's Level of Impairment as Reported by their Mothers Pre/ Post Guidelines Intervention.

Children's Level of Impairment	Total number of children [No.=40(100%)]				Test of significance	
	Pre		Post		t-test	P Value
	No	%	No	%		
• Mild impairment (scored < 47)	2	5	5	12.5	33.236	< *0.001
• Moderate impairment (scored 48 : < 94)	3	7.5	27	67.5		
• Severe impairment (scored 95 : < 141)	35	87.5	8	20		
Total Mean Score $\bar{X} \pm SD$	101 \pm 4.07		67.78 \pm 3.95			

*P<0.001 = highly statistical significance.

Table 7 showed that the total mean scores of studied children level of impairment as reported by their mothers were 101 \pm 4.07 pre guidelines intervention compared to 67.78 \pm 3.95 post guidelines intervention that indicated high statistical significant differences (t test = 33.236, at p <0.001).

Table (8): Distribution of Mothers' Potential Stressors Pre/ Post Guidelines Intervention.

Mothers' Stressors	[No.=40(100%)]				Test of significance	
	Pre		Post		t-test	P Value
	No	%	No	%		
• Mild stress (scored ≤ 40)	1	2.5	2	5	31.973	< *0.001
• Moderate stress (scored 41: ≤ 80)	2	5	35	87.5		
• Severe stress (scored 81: ≤ 120)	37	92.5	3	7.5		
Total Mean Score $\bar{X} \pm SD$	99.63 \pm 5.62		73.23 \pm 5.92			

P<0.05= statistical significance, *P<0.001 = highly statistical significance,

P>0.05= statistical insignificance.

In relation to mothers' potential stressors that are sometimes experienced as a result of having a child who displays behavioral difficulties, table 8 demonstrated that, total mean scores of mothers' stressors was 99.63 ± 5.62 pre guidelines intervention compared to 73.23 ± 5.92 post guidelines intervention which reflected highly statistical significant differences (t-test=31.973 at $P < 0.001$).

Table (9): Correlation between Total Mean Scores of Mothers' Stress and Their Children' level of Impairment

Variables	Total Mothers' Stress	
	r	P-value
Total Children' Level of Impairment	0.630	0.000

Regarding the correlation between children' level of impairment and their mothers' stress, table 9 proved that, there was a positive correlation between children' level of impairment and their mothers' level of stress ($r = 0.630$, $P \text{ value} = 0.000$), whereas children's severe impairment was associated with severe mothers' stress and vice versa.

IV. DISCUSSION

Attention deficit hyperactivity disorder is a highly prevailing, enduring a neurobehavioral disorder affecting millions of children. ADHD typically begins in childhood and often persists into adulthood. ADHD is characterized by developmentally inappropriate levels of attention and hyperactivity with subsequent functional impairment in academic, family and social settings (*EL-Sayed, 2018*).

As mentioned by *Eiraldi et al., (2012)*, due to behavioral difficulty at home, children with ADHD commonly have traumatic and conflicting interactions with their parents, which negatively influence parent-child relationships and parents' ability to support their children's education. In addition, conflict between families and schools is common among children with ADHD, which further contributes to school problems. This conflict may be a consequence of parental dissatisfaction with the teacher's attempts to meet the educational needs of the child.

In relation to the characteristics of the studied mothers (*table 1*), results of the current study showed that, the mean age of the studied mothers was $\bar{X} \pm SD = 30.3 \pm 5.40$ and more than two fifths of them having two children.

These findings were contradicted with *Mikkelsen et al., (2017)*, who reported in a similar study that, increased risk of ADHD with decreasing maternal age which may be linked to pregnancy or early-life environmental factors. Children diagnosed with ADHD more often had younger parents compared with children without a diagnosis of ADHD. This contradiction may be due to difference of population cultures, study samples, settings and research methodology.

As regards the sources of mothers' knowledge (*table 1*), findings of the present study displayed that, nearly one third of the mothers get their knowledge through awareness leaflets while the minority of them get their knowledge through internet. These findings were contradicted with *Amiri et al., (2016)*, who proved in a similar study that, the sources of knowledge acquisition were reported to be the family and friends in more than half of the study sample, radio and TV programs in more than third of them, while reading books was the source of knowledge of one quarter of the study sample and the rest of them acquired their knowledge through the internet, newspapers, magazines, training courses and academic education. In this context *Dodangi et al., (2017)*, emphasized that, the most common source of parent's information about ADHD was TV as observed in nearly two thirds of the studied mothers.

Regarding the studied mothers' level of education, (*figure 1*) results of the current study proved that more than half of mothers were read and write, while, the minority of them were illiterate. This finding was contradicted with *Zaki and Ahmed, (2015)*, who reported in a similar study that, more than half of the studied mothers were secondary education learners. This difference may be due to difference of study settings. These results were in contradiction with *Mirzaaghasi et al., (2014)*, who mentioned in a similar study that, the minority of the studied mothers were secondary education learners, while nearly two fifths and more than one third of them had Diploma and Bachelor degree respectively.

As regards the studied mothers' occupation (**figure 2**), findings of the present study clarified that, more than three fifths of them were housewives. In the same context *Huhtala*, (2015), stated that, chronic stress, such as daily hassles, work stress, marital issues and financial problems, have been associated with increased risks regarding both fetal development and consequent psychological development.

In relation to the parents' consanguinity (**figure 3**), findings of the current study illustrated that, more than four fifths of the studied mothers had negative parents' consanguinity. This result was disagreement with *EL-Gendy et al.*, (2016), who found in similar study that, ADHD was more likely in children with positive parental consanguinity and whose mothers were exposed to passive smoking during pregnancy.

In the same context, *Farahat et al.*,(2014), confirmed that, the major risk factors for ADHD were neonatal problems (cyanosis, low birth weight, jaundice), family history of psychiatric illness, gender, family history of medical illness, consanguinity, antenatal illness and drug use, and family size greater than four.

On investigating the characteristics of the studied children (**table 2**), it was observed that, the mean age of children was 7.10 ± 1.78 and the majority of them were boys. These findings were parallel with *Amiri et al.*, (2016), who mentioned that the mean age of the studied children was 7.71 ± 0.69 years. Conversely, *Sung et al.*, (2010), who reported in a similar study that mean age of the studied children was 11.7 ± 3.2 , while more than nine tenths of them were males. In the same context, *Kieling and Rohde* (2011), emphasized that, the prevalence of ADHD is higher in boys than in girls, with male/female ratio varying from 3:1 to 9:1, dependent on the origin of the sample.

As regards the diagnostic subtypes of ADHD for the studied children (**figure 4**), it was noticed that, more than two thirds of the studied children had combined diagnosis of ADHD, while nearly one seventh of them were diagnosed with inattention subtype of ADHD. These findings were consistent with *Terpsichori et al.*, (2018), who proved in a similar study that, nearly two thirds of the studied children were Hyperactive/Impulsive-Combined type while one fifth of them were inattentive.

In relation to the effect of evidence based practices guidelines intervention regarding ADHD on the studied mothers' knowledge (**table 3**), it was noticed from the current study findings that, most of the studied mothers had satisfactory knowledge regarding definition, causes, treatment of ADHD, symptoms that indicating impulsivity of the child and tips for handling of child's daily problems that indicated highly statistical significant difference that explained the positive effects of guidelines intervention. From the researchers' point of view mothers' knowledge anticipated their adherence to pharmacotherapy and prescribed interventions actively.

These findings were supported by *Zaki and Ahmed* (2015), whom reported in a similar study that, there was a highly statistical significant difference between mothers' knowledge related ADHD pre and post program implementation as revealed by $P < 0.01$. This reflected that there was upgrading in parents' knowledge post program application compared with pre- program.

In the same line, *Malek et al.*, (2010) mentioned that, little knowledge about human normal development, disorders and abnormal social behaviors lead to misconceptions and might influence the sources of knowledge acquisition especially among adolescents. Therefore, children and adolescents may get information from sources other than their parents or teachers in which plenty of abnormal data may put them at the risk of social rejection.

As regards total mean score of studied mothers' knowledge regarding ADHD pre/ post guidelines implementation (**Table 4**), findings of the current study clarified that, there was significant improvement detected regarding total mean score of satisfactory mothers' knowledge about ADHD post guidelines' intervention. This result may be due to mothers needs and their insistence to acquire the related knowledge to know how to handle the children' daily living problems and overcome the obstacles to alleviate daily family suffering. These findings were supported by *Amiri et al.*, (2016), who focused in a similar study that, the variety of symptoms, consequences, high incidence and numerous treatment of ADHD necessitate the parents to have an extensive knowledge and a positive attitude towards ADHD. It makes the parents cope with patients' conditions and accomplish the treatment process in their children with ADHD.

On investigating the effect of guidelines intervention on children' daily living problems as reported by their mothers (**table 5**), findings of the present study indicated that, there was a highly statistically significant difference pre and post evidence based practices guidelines intervention. This may be attributed to acquiring the correct knowledge and daily life

practices and learning how to deal with children's strange activities, behaviors and daily living problems that positively reflected on children's emotional problems, social problems, academic difficulties, hyperactivity, impulsivity and inattention of children suffering ADHD. These findings were consistent with *Alazzam and ALBashtawy, (2016)*, whom mentioned that, early effective actions for parents in particular cases and for families in general can ease the consequences of the disorder during the life sequence of the child as well as affecting the family's outcome. Health care professional may play a part in helping families of children with ADHD by providing them with regular updated information about ADHD.

In the current study the researchers discovered that, all mothers having to miss work or delay domestic responsibilities because of child's problems, also, they haven't enough time for themselves because of child's behavior. Meanwhile, the majority receiving calls from school regarding child's academic problems and getting complaints from school bus driver.

In this regards, *Harazni and Alkaissi (2016)*, reported that, "mothers face many difficulties in the child's academic track. It was the difficulty for the child to concentrate, especially during the conduct of school homework, that has been very stressful for mothers and it consumes a lot of mothers' time. The problem of inattention of the child makes the quality of studying time ineffective. So the problem of inattention affects the child's academic achievement, and increases the difficulty of taking care of the child. The mothers believe that despite the effort they make, and the time they spend with the child to study, the child's academic level was still very poor. Mothers face difficulties in making the child sit and study; it was clear in this study that the mother was the only one responsible to ensure the child studies, so for this reason, the child's study was a heavy burden for the mother. Daily activities were another problem faced by mothers. The child cannot complete anything without help from the mother, who experiences a load on her".

In the same context, *Young (2015)*, stated that the child with ADHD may have difficulty following and remembering instructions, leading to unfinished tasks and unmet goals. The child may be observed to start a practical activity but forget or miss out steps or go off-task and leave it prematurely. Children may receive warnings for oppositional behavior due to incomplete classwork and homework. The child may fight to stay seated even when this was needed or important, getting up multiple times. This may be observed by the child roving around the room when watching television and/or leaving their seat at the dinner table. The children may need continuous engagement to help them remain seated on public transport and they may fight to cope with long journeys.

Furthermore, *Richards et al., (2014)* and *Vaziri et al., (2014)* emphasized that teaching the family members how to deal with affected children with ADHD and programs for parents should offer information of how to reduce their insecurity and feelings of shame or guilt. Moreover, such programs should provide them with methods and strategies to decrease the level of stress that their children's behavior can cause and teaches them to identify and value progress.

On investigating children's daily living problems (**table 6**), findings of the current study revealed that, there was a clear improvement in the total mean scores of children's daily living problems as reported by their mothers through using Connors Parent Questionnaire post guidelines intervention compared to pre guidelines intervention that indicated highly statistical significance difference ($P < 0.001$).

Regarding the effect of guidelines intervention on the level of impairment of children with ADHD (**table 7**), it was observed from the current study findings that, there was highly statistically significant differences ($P < .001$) in children's level of impairment as reported by their mothers pre and post guidelines intervention. This may be reflecting the importance of providing guidelines intervention and educational programs for improving daily living problems in addition to active involvement of mothers as well as active communication and adequate illustrations by the researchers.

These findings were supported by *Zaki and Ahmed (2015)*, whom mentioned in their similar study that, psycho-educational training program have positive effect on the practices, coping strategies and stress of parents having children with ADHD.

On investigating the effect of guidelines implementation on mothers' potential stressors (**table 8**), it was observed that, there was highly statistical significant differences in mothers, stressors pre and post guidelines intervention. In the same context, *Yousefia and Abdolahian (2011)*, emphasized that, raising children with ADHD and attending to their behavioral inconsistency may result in abusive parenting techniques in an effort to manage the behaviors of their children. Consequently, negative parenting techniques have been found to develop parental anxiety in families of children with ADHD.

These findings were supported by *Terpsichori et al., (2018)*, who stressed on the importance of developing intervention programs, not only to manage and treat the ADHD symptomatology of children, but to also develop strategies to assist in the management of the various aspects of parenting stress and psychopathology, whilst educating parents on how to cope with them. This suggestion was in accordance with many researchers, whom have stressed the value and the positive outcomes of dealing with parenting stress and psychopathology, which were thought to impede the efficiency of the child's treatment, while intensifying the severity of the child's symptomatology.

In this context, *Barkley (2014)*, mentioned that, having a child with ADHD can also have an impact on the mental and emotional health of parents, can also have often feel mentally tired, distressed, depressed, and in need of guidance and education about the disease and how to deal with their children. Moreover, siblings of children with ADHD may not completely understand the disruptive behavior of their brother/ sister with ADHD and that could in itself add to the stressful circumstances within the family.

Concerning children' impairment and their mothers' level of stress (*table 9*), findings of the present study illustrated that was, there was a positive correlation between children' level of impairment and their mothers' level of stress, this explains that there was an association between children' level of impairment and behavioral disturbance and their mothers' level of stress. Whereas children's severe impairment was associated with severe mothers' stress and vice versa.

This finding was supported by *Lovell et al., (2012)*, who reported in a similar study that, high level of parental stress or perceived burden of the child's mental disorder, reduced spousal support contribute to high caregiver strain commonly reported among parents of ADHD. In the same lines, *Al-Mahmoud (2013)*, demonstrated that, parents of children with ADHD experience greater parenting stress than parents of children without ADHD. Parents of children with ADHD also report less helpful social support and having fewer outside resources may increase the family burden of effectively overcoming the child's disruptive behaviors.

V. CONCLUSION

In the light of the current study it can be concluded that, application of evidence based practices guidelines has a positive effect on daily living problems and level of impairment of children suffering from attention deficit disorder and also was highly effective in improving the studied mothers' knowledge and alleviating their daily stressors and psychological constraints as a result of having child with ADHD.

VI. RECOMMENDATIONS

In the light of the current study findings the following recommendations were suggested:

- Evidence based practices intervention should be conducted for all mothers and their children suffering from attention deficit hyperactivity disorder in all institutions providing care for those children.
- Instructional pamphlet and illustrated booklet about ADHD should be available at all health centers providing care for children suffering from ADHD and for their mothers.
- Periodical follow-up for mothers to increase and update their knowledge, awareness and practices as regards caring of their children suffering from ADHD.
- Appropriate intervention to decrease mothers' stress levels and enhance their abilities to support their children suffering from ADHD based on their actual needs and problems.
- Further researches are required involving larger study sample of children suffering from ADHD and their mothers about the effect of evidence based practices guidelines intervention at different settings providing care for those children all over Egypt in order to generalize the results.

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