

## Mindfulness Based Intervention Program For Mothers Of Children With Attention Deficit Hyperactivity Disorder

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**Abstract:** Background: Attention-deficit hyperactivity disorder (ADHD) is one of the most common neurobehavioral disorders among children. Higher levels of stress, poor quality of life, less parenting satisfaction and perplexing child behaviors that evokes harsh parenting are common among mothers of ADHD children. Aim of the study was to evaluate the effectiveness of a mindfulness based intervention program on mothers of children with attention deficit hyperactivity disorder. Subject and methods: the study was conducted in the child psychiatric outpatient clinic at Fayoum university hospital, Egypt using a quasi-experimental design with one-group pre-post assessment. The sample consisted of 50 mothers accompanying their ADHD children to study setting. Data were collected using a self-administered questionnaire sheet for demographic data, attention deficit hyperactivity disorder beliefs scale, parenting scale, the Arabic version of Conners' rating scale and the Kessler psychological distress Scale (K10). Mindfulness Based Intervention Program for mothers was designed and implemented to improve mothers' beliefs, parenting practices with ADHD children, mindfulness in parenting and decrease their psychological distress. The study lasted for 14 months from May 2017 to June 2018. Results, only 4% of mothers had positive beliefs regarding attention deficit hyperactivity disorder at the pre-intervention phase and it increases to 94.0% post-intervention. There was improvement in mother's parenting practices, mothers' mindfulness in parenting and Conners' rating scores at post-intervention phase ( $P$ - value  $<0.001$ ). Moreover, severe psychological distress converted to mild distress in majority of mothers (92%). In multivariate analysis, the Conners' rating score was the only statistically significant independent positive predictor for the improvement of mothers' psychological distress. Conclusion: the Mindfulness based intervention program tailored to mothers' needs is effective in improving mothers' beliefs, parenting practices, positive changes in child behavior and mindfulness in parenting as well as reducing psychological distress among studied mothers regarding ADHD children. Recommendation: involving the ADHD children in the mindfulness based intervention programs. Further researches to evaluate the effects of Mindfulness based intervention program on the mothers' coping, QOL, parenting satisfaction, psychological well-being.

**Key WORDS:** Mindfulness, Intervention program, Mothers, Psychological distress, ADHD child, Conners' scale, Parenting.

Date of Submission: 27-08-2018

Date of acceptance: 11-09-2018

### I. Introduction

Attention-deficit hyperactivity disorder (ADHD) is one of the most common neurobehavioral and psychiatric disorder among children that is characterized by the core symptoms of inattention, motoric over activity, impulsivity, easy distraction from important tasks, recklessness, moodiness, impairment in executive functions and fidgetiness with an early onset<sup>1</sup>.

Some parents realize signs of inattention, hyperactivity, and impulsivity in their toddler long before he/she enters school. But because children mature at different rates and are very different in personality, temperament, and energy levels, it's useful to get an expert's opinion of whether the behavior is appropriate for the child's age. Ideally, child psychiatrists and psychologists, developmental/behavioral pediatricians, or behavioral neurologists and specialized nurses are those most often trained in this area as multidisciplinary team<sup>2</sup>.

Mothers play a unique role as the primary caregivers in management of their children with ADHD. Their demands and parenting are a huge responsibility and impose a severe burden. Therefore, behavioral parent training is one vehicle through which psychological assistance can be provided, it involves working with parents

to improve their parenting behaviors using mindfulness techniques in order to increase positive outcomes with their children and therefore treat ADHD<sup>3</sup>.

Innovative psych-education strategies include mindfulness that may offer an active coping mechanism for mothers faced stress due to having a child diagnosed with ADHD. These strategies empower mothers' adaptation to the child illness as well as acceptance their child case which can basically change the relationship between mother and their child and tends to be associated with lower levels of fear, anxiety and worry<sup>4</sup>. Mindfulness strategies can be a helpful tool that assists mothers during an incredibly stressful time for them, and for their family by allowing them to pause and be present in the moment rather than wishing something different was happening or worrying about tomorrow<sup>5</sup>.

Mindfulness training improve the ability to strengthen attention, emotional, cognitive and physiological processes; it improves mothers' self-regulation in response to their child's challenging behavior and alters the dysfunctional patterns in their parenting behavior as well as it may help mothers to cultivate open and nonjudgmental ways to pay attention to children which can improve parental acceptance that ADHD is a chronic and pervasive disorder; acceptance means acknowledging the reality of a situation, accepting the limits of control and taking the actions that can be pursued<sup>6</sup>.

Nurses need to implement mindfulness interventions that consistent with the requirements of mothers who have a busy life schedule, that help mothers having a deeper awareness of own stress reactions and emotional reactivity, increased ability to respond more skillfully with patience, compassion and wisdom to the unplanned and stressful moments and cope with many stressors associated with ADHD child<sup>7</sup>.

### **Significant of the study:**

According to<sup>8</sup>, the prevalence rate of ADHD among children worldwide is 3%–4% and in KSA is 8.4%<sup>9</sup>. However, the prevalence rate of ADHD in El- Fayoum, Egypt is 20.5% among school-age children depending on a DSM-5-based rating scale<sup>10</sup>.

According to the statistical records, total flow rate number of ADHD children to psychiatric outpatient clinic constitutes 24% from total number of psychiatric children (*unpublished statistical records from Fayoum university hospital, psychiatric children out patients' clinic, 2016*).

Mothers of ADHD children reported a higher levels of stress, lower levels of quality of life and less parenting satisfaction in addition to perplexing child behavior evokes harsh parenting<sup>11</sup>. So, the researchers conducted this study to apply mindfulness strategies for those mothers as a one of the crucial issues needing for mothers' having ADHD child to receive help, guidance, understanding, counseling, and education. Moreover, mindfulness can help mothers to increase their awareness to bring compassion and curiosity to decrease level of anxiety and worries; it also helps mothers to notice that painful thought, uncomfortable emotions and increase the attention regulation to increase the satisfaction feeling, wellbeing as well as their children.

### **Aim of the study**

This study aims to evaluate the effectiveness of a mindfulness based intervention program on mothers of children with Attention Deficit Hyperactivity Disorder (ADHD).

### **Research hypothesis:**

This study assumes that designed mindfulness based intervention program will have a positive effect on beliefs, mindful parenting and psychological distress of mothers who having ADHD child.

## **II. Subjects And Methods**

**Research design:** quasi experimental design with one-group pre–posttest.

**Setting:** The study was carried out at the child psychiatric outpatient clinic at El-Fayoum university hospital, El-Fayoum, Egypt.

**Sample size:** The study sample consisted of 50 mothers have ADHD child. They were eligible for inclusion in the study sample whenever they met the following criteria.

#### ■ **Inclusion criteria:**

- Mothers of children's age ranged from 5-12 years.
- Consistently accompanying his/her child during receiving medication regimen

#### ■ **Exclusion criteria:**

- Mothers of children suffering from any other disorder in addition to ADHD (e.g., cerebral palsy, mental retardation, epilepsy, psychosis, etc...).

**Sampling:** A purposive sample based on expected difference of intervention effect on parenting score based on previous research<sup>11</sup> with standard deviation of outcome variable is 6. To achieve 80% power to detect this difference with a significance level of 5%. (All mothers of children with ADHD registered at initiation of the

study as well as those of new cases during the entire period of the study (6 months period) were invited to participate in the study.

**Tools of data collection:**

Data were collected through the following tools:

**Tool I: Self-administered questionnaire sheet:** This tool was designed by the researchers in simple Arabic language, after reviewing related literature. It included the characteristics of mothers have ADHD child such as age, marital status, educational level, job as well as child-related socio-demographic data such as age, sex, school attendance.

**Tool II: Attention deficit hyperactivity disorder Beliefs Scale** was developed and adopted by <sup>12</sup> and consists of 27 items assessing mothers' knowledge, beliefs and attitude related to the causes of, characteristics and treatments for ADHD. It includes beliefs in behavior management (eight items), beliefs in medication (six items), beliefs in psychological causes/treatments (nine items), and beliefs in diet/vitamin treatments, (four items). The Arabic version of the beliefs scale has adequate internal consistency as measured by Cronbach's alpha was 0.78. Higher scores reflect more satisfactory knowledge and positive attitude and beliefs.

**Tool III: Parenting Scale (PS):** It was validated by <sup>13</sup> designed to assess dysfunctional discipline parenting practices and behaviors. It consists of a self-report 30-item on three subscales namely laxness, verbosity and over reactivity. The scale was translated by the researchers. The Arabic version of the PS has adequate internal consistency as measured by Cronbach's alpha was 0.84. Items "\*" indicates that item should be reversed when calculating the subscale score. Higher scores reflect more effective discipline practices and behavior. Mothers' responses on items were categorized into effective "adequate" and ineffective "inadequate" responses, receiving scores of 1 and 0, respectively

**Tool IV: The Arabic version of Conners' Rating Scale** was developed and adopted by <sup>14</sup> and translated into Arabic by <sup>15</sup>. It consists of 10 items intended for identifying ADHD and assessing its severity on a four-point Likert scale and scored from 0-3, whereas not at all "0", just a little "1", pretty much "2", and very much "3". The total score ranges from 0 to 30. Responses with scores above 15 are considered to have severe symptoms. The Arabic version has adequate internal consistency as measured by Cronbach's alpha was 0.77.

**Tool V: Mindfulness in parenting questionnaire:** It consists of twenty eight questions <sup>16</sup> designed specifically to assess the mindfulness in parenting among mothers having ADHD children. 28 Answers use a five-point Likert scale that ranges from 1 (never) to 5 (always). The total score may be obtained by summing all the items, with higher scores indicating higher levels of mindfulness in parenting so that, the lowest score indicates the least desirable state. The tool was translated by the researchers obtain a comprehensible instrument that was conceptually consistent with the original. The internal consistency as measured by Cronbach's alpha was 0.87.

**Tool VI: The Kessler Psychological Distress Scale (K10):** this tool was developed by <sup>17</sup> and used in to measure identify levels of psychological distress among the mothers. It involves 10 questions about emotional states with a five response. Each item is scored from one 'none of the time' to five 'all of the time'. Scores of the 10 items are then summed, yielding a minimum score of 10 and a maximum score of 50. Low scores indicate low levels of psychological distress and high scores indicate high levels of psychological distress. The tool was translated by the researchers. Its internal consistency as measured by Cronbach's alpha was 0.89.

**Tools Validity and reliability:** To achieve the criteria of trustworthiness of the tools of data collection as well as Mindfulness Based Intervention Program booklet in this study, the tools were tested and evaluated for their face and content validity by a jury group consisting of nine experts from academic nursing and medical staff in different fields in pediatrics, pediatric health nursing, psychiatric mental health nursing, psychiatrist, and specialists in rehabilitation and special needs center.

The reliability of the tools was assessed through five subjects using the developed questionnaire and reassessment after seven days on the same subjects; the results were the same each time. The reliability of the tools that was assessed through measuring their internal consistency by determining Cronbach alpha coefficient, proved to be high as indicated in the following table.

**Pilot study:** The tools were pilot-tested on 5 mothers of ADHD children to investigate its feasibility, clarity and applicability. The pilot subjects were not included in the main study sample.

**Study maneuver:**

- Mothers of 50 children with ADHD were assigned to three groups; each consists of fifteen to twenty mothers. The researchers contacted the mothers of ADHD children individually to explain the purpose and procedures of the study to obtain their informed consent to participate.

- All mothers received a total of six sessions once a week for one month and a half, 30 – 45 min per session. Mindfulness-based intervention program was conducted through a collaborative approach using different methods including illustrations, brain storming, vignettes, role playing, and group discussions.
- Evaluation of the effect of the Mindfulness-based intervention program was performed one month after the implementation of intervention program using the pre-test tools.
- The study was carried out in a period lasting 14 months from May 2017 to June 2018.

**Mindfulness Based Intervention Program** The researchers set its objectives and content according to the mothers' requirements and deficiencies as identified from the results of the pre-test to improve mothers' mindfulness practices in parenting and understanding of their children's illness and treatment in order to be more skillfully and efficiently capable of managing their daily requirements.

**1<sup>st</sup> Session:** Introduction and overview of ADHD and understanding deviant child behavior.

**2<sup>nd</sup> Session:** An overview of mindfulness (Acceptance, commitment, Awareness mindfulness living, Intention, patience, empathy and child-centeredness). Being mindfulness in actions, feeling and thoughts is something that can be trained as any other skill.

**3<sup>rd</sup> Session:** The basic principles of mindfulness in parenting (active skills training and realistic expectations).

**4<sup>th</sup> Session:** positive parenting practices.

**5<sup>th</sup> Session:** Mindfulness parenting (insight, motivation, day-to-day versus complex/long-term needs, fostering attachment and consistency).

**6<sup>th</sup> Session:** Mindfulness breathing and step by-step body scanning exercises and its impact on psychological distress.

**Administrative design:**

Official letters were submitted from the director of the Faculty of Nursing, El-Fayoum University to the director of hospital, and to the head of out-patient Psychiatric Clinic

**Ethical consideration and Human Rights:** All relevant ethical aspects were considered in conducting the research. The participants were assured that their participation in the study is voluntary and that they can withdraw at any time; confidentiality and privacy of the participants were respected. Also informed insist of mothers were taken to participate in the study.

**Statistical design:** Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Descriptive statistics was calculated in the form of frequencies and percentages for qualitative variables, and means, standard deviations and medians for quantitative variables. Appropriate statistical test as McNamar was used for the comparison of dependent samples. Statistical significance was considered at  $p\text{-value} \leq 0.05$ . Highly Significant was considered at  $p\text{-value} \leq 0.001$ .

### **III. Results**

Mothers and children characteristics were shown in table (1). The mean age of the studied mothers was  $26.3 \pm 2.8$  years while the highest percentage of mothers (40.0%) had intermediate education. more than three quarter of them were housewives (78.0%). The majority of the mothers 80% are married. The age of children ranged between 5 and 12 years, with mean  $\pm$  SD  $7.23 \pm 1.8$  years. Male children constituted slightly less than three quarter (74%). The majority of the children were joined to schools (78.0%).

**Table (1):** Distribution of the studied mothers and their children according to their characteristics n= 50

Mothers characteristics	Frequency	Percent
Age		
• <20	10	20%
• 20-30	16	32%
• >30	24	48%
M±SD= 26.3± 2.8		
Education		
• illiteracy	3	6 %
• Read and write	4	8%
• primary	13	26%
• Secondary	20	40%
• university	10	20%
Occupation		
• Working	11	22%
• No working	39	78%
Marital status		
• Married	40	80%
• Divorced	7	14%
• widow	3	6%
Children's characteristics	Frequency	Frequency
Child age		
• >6 years	19	38%
• 6-12 years	31	62%
M±SD= 7.23±1.8		
Child sex		
• male	37	74%
• female	13	26%
Child education		
• Preschool	11	22
• School	39	78

Figure 1 shows that, the majority of studied mothers (94.0%) had positive beliefs after intervention compared with the 4.0% before intervention. Nearly two third of the studied mothers (66.0%) had improvement in the total beliefs score after intervention program reach to statistically significant improvements.

**Figure 1:** Mothers' Beliefs regarding attention deficit hyperactivity disorder (pre and post intervention) n= 50

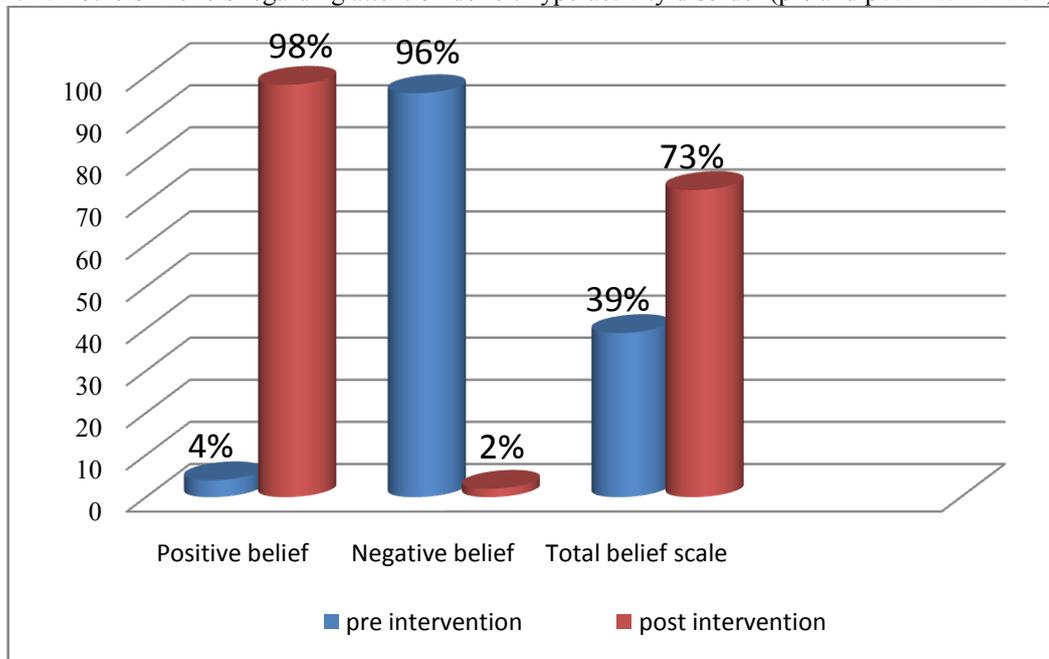


Table (2) shows improvement in mother's parenting practices before and after the program. The difference was statistically significant in laxness and verbosity subscales of mother's parenting practices scale where no statistical significant in over-reactivity subscale and total parenting scale score.

**Table (2):** Total mean scores for mothers’ parenting practices for their children before and after the intervention n= 50

Parenting scale	Total mothers Number = 50				t- paired	p-value
	Pre (n=50)		Post (n=50)			
	Mean	SD	Mean	SD		
Laxness	4.5600	1.48681	7.2800	1.67868	9.37	<0.01*
Verbosity	6.9200	1.88268	5.4000	2.08982	4.8	<0.001*
Over reactivity	3.1800	1.08214	3.0200	1.05926	0.774	0.445
Total Parenting scale score	14.6600	3.66790	15.7000	3.60979	1.606	0.115

\*p<0.01 statistical significant

There was highly statistically significant difference was observed pre/post intervention regarding mothers’ mindfulness in parenting and Conners' rating scores where P- value <0.001 as indicated in table 3.

**Table (3):** Total mean scores for mindfulness in parenting scale and Conners' rating scale pre and post intervention

Items	Total mothers Number = 50				t- paired	p-value
	Pre (n=50)		Post (n=50)			
	Mean	SD	Mean	SD		
Total mindfulness in parenting scale	63.6200	5.98600	99.7600	6.01549	42.365	<0.001*
Total Conners' rating scale	23.3400	2.84720	13.4400	2.74910	24.365	<0.001*

Statistically significant at p<0.05

Figure (2) shows that, the majority of studied mothers (94%) had severe psychological distress before program intervention. While, psychological distress post intervention changed to mild distress in the majority of mothers (92%).

**Figure 2:** Distribution of Mothers’ psychological distress before and after intervention program n= 50

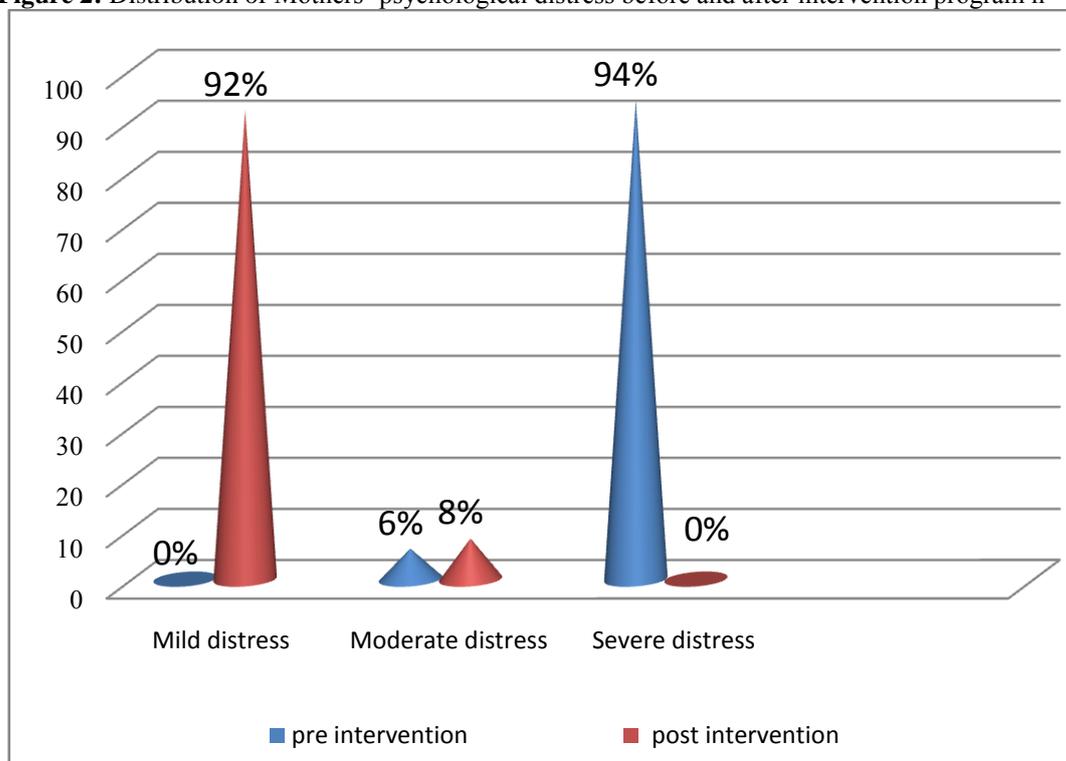


Table (4) shows negative correlation between mindfulness in parenting scores and mother beliefs, parenting practice and Conners' rating scale scores, this means that mindfulness in parenting was associated with decreasing severity of symptoms, negative parenting disciplines and negative beliefs.

**Table 4: Correlation between mothers' mindfulness in parenting scores and their response to belief, parenting practice and Conners' rating scale pre/post scores**

Items	Mindfulness in parenting questionnaire	
Conners' Rating Scale	r	-.408**
	p- value	.003
PS score	r	-.350*
	p- value	.013
Mother belief score	r	-.080-
	p-value	0.580

Table (5) shows the multiple linear regression models for psychological distress scores post intervention while, Conner' score was identified as the only statistically significant independent positive predictor of mothers' psychological distress score. The model explains only 78% of the variation in this score. None of the other variables had any significant influence on the psychological distress.

**Table (5): Best fitting multiple linear regression model for psychological distress scores post intervention**

	Unstandardized Coefficients		Standardized Coefficients	t-test	p- value
	B	Std. Error			
(Constant)	20.556	8.791		2.338	<0.001
Conners' score	.223	.106	.322	3.575	<0.001

r-square=0.78 Model ANOVA: F=104.953, p<0.001 Variables entered and excluded: child educational level , Pre stress level , Mindfulness Belief score, child sex, mother education level, mother age

#### IV. Discussion

The present research involved an evaluation of a mindfulness-based intervention program for mothers of Children with ADHD. There is growing evidence supporting mindfulness-based interventions as effective for a wide range of physical and mental health conditions in a range of populations<sup>18</sup>.

The characteristics of the studied mothers are consistent with<sup>19; 20</sup>, while the characteristics of the children are consistent with,<sup>21, 22</sup>.

In the present study, there was a statistically significant improvement in total mothers' beliefs at the post-intervention phase regarding to belief in behavior management, belief in medication, belief in psychological causes/treatments and belief in diet/vitamin treatments of ADHD. This may be partly attributable to the study setting and socioeconomic profile of the study sample. The study was carried out in a psychiatric out-patient clinic in El-Fayoum University hospital that is characterized by a high rate of attendance, where team have very limited time to offer educational services for parents. Furthermore, the majority of parents attending the clinic had a low level of education, which limits their chances for self-education and. As expectedly, the concern of parents focuses on treatment options rather than on other issues such as causes of the problem and facilitating programs.

The results of the present study highlight one of the important unmet needs of mothers having children with ADHD. These results lead to approval of the study research hypothesis. The acquisition of parental knowledge of ADHD and behavior management has been considered as an important element in the overall treatment of childhood. Our findings were supported by<sup>23</sup>, who reported a significant changes in the total mean scores of Australian parents of ADHD children following a psycho-educational program.

As for mothers' parenting practices as measured by parenting scale, the present study showed a significant improvement in mother's Parenting practices in laxness and verbosity subscales. This positive change in mothers' parenting practices was a direct effect of the mindfulness program through improving their beliefs about ADHD, decreasing the severity of ADHD symptoms and severity of mothers' psychological distress.

In agreement with this,<sup>11</sup> in their study in Alexandria, Egypt reported significant changes in the total mean scores of parenting practices regarding ADHD children following a psychosocial intervention. However, parents have an enormous impact on their child's behavior creating a window of opportunity to teach parents how to be positive and consistent in their parenting responses, help reduce noncompliant and aggressive behaviors, and help their child persist at a difficult task and provide successful experiences for their child, improved task-related attention and ability to delay activities and decreased disruptive behaviors. The importance of providing consolidation sessions to such programs to maintain their positive effects was recommended by<sup>24</sup>.

This study examined the impact of parents' mindfulness-based intervention on controlling children with attention deficit/hyperactivity disorder. The present study showed a highly statistically significant difference

was observed pre/post intervention regarding Conners' rating scores ( $P < 0.01$ ). Our findings indicated that the severity of ADHD symptoms improved significantly after the intervention program. This ensures that the mindfulness program performed as effective variables reduce ADHD's signs as dependent variable.

Generally sustainability of the effects over time is a problem that awaits further scrutiny. In agreement with a meta-analysis done by <sup>25</sup> concluded that a parent training program could effectively enhance the ability of parents to manage their ADHD children and reduce symptoms. In the same line outcome data of an American study carried out by <sup>26</sup> who showed that parent training reduced children's hyperactive, defiant, and aggressive behaviors.

Similar findings were reported by <sup>27</sup> in a study in Iran reported that the specialists and psychologists can also use drug therapy along with the other common treatments as a complementary therapy and parent training for decreasing the symptoms in children suffering ADHD. Parent practices are important for the developmental course and treatment outcomes of ADHD <sup>28</sup>. However, a study done in Egypt by <sup>29</sup>, reported that parents with children who had ADHD were evaluated in El Abbasia hospital. The results showed that the mean Conners scale of parents in the case group had a significant difference after intervention.

Other study <sup>30</sup> also attributed the effectiveness of such training for mothers to some reasons; as many of the problem behaviors of children with ADHD are rooted in their interactions with parents (especially mothers) which in turn helps these problems persist over time, having trained the correct ways of how-to-behave to mothers of such children- with whom these children spend their time more than anyone else- as well as having provided a consistent principle of reinforcement, might have decreased the likelihood of undesirable behaviors in these children.

Whereas, <sup>31</sup> demonstrated that training mindfulness skills imply inducing changes in the way mothers pay attention to their children and have fostered more adaptive behaviors in these children. Mindfulness training beneficial attention skills, such as listening and positive attention skills might have created the opportunity for mothers to learn how to pay attention to their children without interrupting and asking questions and to learn how they can instill desirable behaviors which they wish their children to increase or continue to have through positive statements. As it has been observed, many of these children's mothers turn to punitive and aggressive parenting styles in order to manage adverse behaviors accompanying the disorder pre intervention.

The current result is consistent with <sup>32</sup> who reported that mindfulness training for mothers had been effective for reducing children hyperactivity that focus on the underlying assumption that the child's mood and mother's behavior influence each other in an interactive fashion. On the other hand, <sup>33</sup> suggest the ineffectiveness of mothers' behavioral trainings for reducing inattention among ADHD children. One explanation for this discrepancy could be that inattention, in comparison to other problems, is more resistant to change against behavioral trainings because of its more biological roots.

Another beneficial effect of mindfulness-based intervention is reducing in mothers' psychological distress. The present study showed that the mean score of mothers' psychological distress had a significant difference before and after intervention. This study used a novel approach to mitigate psychological distress in mothers of ADHD child. The researchers suggested that the reductions in psychological distress could have resulted from some improvements in the child condition as well as a result of attending some mindfulness-based intervention sessions.

As showed in the current study; the analysis of covariance showed efficacy of participating in mindfulness on parent distress levels. Most parents reported fairly high and inconsistent levels of distress in baseline, which is not surprising given past research suggesting a relationship between distresses and parenting children with ADHD <sup>34, 35</sup>. Moreover <sup>36</sup> documented that the mothers of children with ADHD experience elevated levels of stress in their parenting roles compared with mothers of normal children. Elevated parenting stress is believed to disrupt the parent-child relationship and negatively affect parenting practices. The links between elevated parenting stress, disruptions to the parent-child relationship and parenting practices argue for treatment programs that reduce parenting stress in the families of children with ADHD.

Similar findings were reported by <sup>37</sup> in a study in Jordan, they reported that outcomes supported the conclusion regarding the benefits of MBI on the psychological well-being in parents. Furthermore, these outcomes support the emerging literature on the effectiveness of MBIs to enhance the psychological well-being in parents of children. However the decrease in psychological distress in parents in the intervention group could be due to the fact that attending to symptoms of physiological arousal (such as muscle tension) while maintaining nonjudgmental acceptance would reduce these physical responses. The decrease in stress in parents in the intervention group could be due to the fact that mindfulness practice creates a space between stress and response to stress, which in turn enables the individual to respond wisely rather than to react automatically to stressful situations.

Similarly, <sup>38</sup> reported that parents in their research practiced mindfulness; they became more aware and reflective of their automatic responses to common emotional triggers before they arose and learned how to disengage and calm down more quickly from difficult interactions, allowing them to more effectively cope with

their stress. In mindfulness, parents were taught that physiological stress reactivity can have physical signs (e.g., an increasingly rapid heart rate), and if they attempt to observe those signs, they can use meditative practices to alleviate their heightened emotions before responding<sup>39</sup>.

Further evidence of support is derived from other studies that reported significant reductions in parenting stress, depression, as well as significant improvements in parenting style, and increase in participants' perceived social support following parent training programs<sup>40</sup>.

As revealed by multivariate analysis, this improvement was independently due to decreasing in severity of ADHD symptoms after intervention recorded by Conners' scores as objective predictors, mothers' psychological distress levels significantly decreased. The finding adds to the evidence of the success of the mindfulness-based program. Similar findings were reported by<sup>41</sup> in a study in Iran showed that the mothers' program improved parenting skills and produce effects on concentration of children with ADHD as well as improve in their educational function, learning abilities, impulsive behavior, and motion activity.

As a consequence of the improvement in the present study mothers' beliefs, parenting practice and decreasing in mothers' psychological distress and the severity of ADHD symptoms after implementation of the mindfulness-based program, there were a highly statistically significant difference was observed pre/post intervention regarding mothers' mindfulness in parenting where P- value <0.001. Consequently, an increase in mindfulness scores is expected to result in an improvement in psychological well-being in mothers' of children with ADHD. In the current study, participants reported higher mindfulness scores on posttest measures, which were accompanied with reporting better psychological well-being. The improvements in pre- and post-mean scores found in the current study indicate the feasibility of utilizing -mindfulness-based interventions program.

<sup>42</sup> recommended that all health care professionals who are working with parents of children with ADHD must be aware about the negative psychological symptoms experienced by these mothers. Stress management programs, especially, MBIs which help them to effectively deal with the behaviors of their children, as some parents indicated a desire to receive some training regarding how to effectively deal with challenging child behaviors. In addition <sup>43</sup> recommended in-depth examinations of the experiences of the mothers during mindfulness practice. This may provide data about the unique experience of mothers during practicing mindfulness skills. 0

<sup>44</sup> proposed a model of mindfulness parenting centered on five dimensions: listening with full attention, nonjudgmental acceptance of self and child, emotional awareness of self and child, self-regulation in the parenting relationship, and compassion for self and child. Based on the improvements on the mothers' psychological distress scores, parents reported that all five of these dimensions were enhanced through the intervention were enhanced through the intervention. However <sup>45</sup> stated that mindfulness was a core variable, mindfulness-based program strengthens inner psychological resources, builds psychological resilience, helps with acceptance of current situation and increases tolerance of uncertainty and disappointment.

## **V. Conclusion**

The implementation of mindfulness based intervention program was effective approach in reducing psychological distress among studied mothers which lead to significant improvements in mothers' beliefs, parenting practices, positive changes in child behavior and mindfulness in parenting. However, the independent predictor of mothers' psychological distress scores is Conner' rating score.

## **Recommendation**

Accordingly, the following recommendations are suggested:

- Implementation of mindfulness based program intervention to other similar settings for further confirmation and generalizability of the results.
- Further researches involve the children with ADHD in the mindfulness based intervention programs.
- Effective multimodal intervention should include delivering specialized programs for mothers as an integral component of a child management plan.
- Providing booster sessions to consolidate the beneficial effects of mothers' mindfulness based intervention program.
- Long-term follow-up in order to evaluate the effects of Mindfulness based intervention program on the mothers' coping, QOL, parenting satisfaction, psychological well-being and outcomes of the child with ADHD.

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Somaya E. Abou-Abdou1. “Mindfulness Based Intervention Program For Mothers Of Children With Attention Deficit Hyperactivity Disorder”. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)* , vol. 7, no.5 , 2018, pp. 39-49.