

Effectiveness of an Educational Intervention on Improving Elementary School Teachers' ADHD Knowledge, Attitudes and Self-Efficacy

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Abstract

Background: ADHD is one of the most common childhood psychiatric disorders, not only in Egypt but also in the world. **The aim** was to assess the effectiveness of an educational intervention on improving the elementary teachers' knowledge, attitudes and sense of self efficacy toward ADHD children. **Methods** A quasi-experimental, quantitative, (pre/ post one group) research design was used with 100 elementary teachers recruited conveniently from two schools located at Shebin Elkom city ,affiliated to Ministry of Education, Menoufyia Governorate, Egypt. **Data** were collected by using 3 main tools which are The KADDS scale, The teacher attitude towards inclusion scale (TAIS) ,and Teacher Efficacy Beliefs Scale (TEBS) for instructing and managing students with behavioral difficulties **The results** revealed that, the majority(95% &96%) of studied subjects were Bachelor degree of education .and their mean age was(40.99±9.73). There was a highly statistical significant difference between pre and post interventions of knowledge of Attention Deficit disorders (KADDS), teacher self-efficacy beliefs at p-value < 0.000. While, there was no significant difference between pre and post teachers' attitudes of including ADHD students in their regular classes. **Conclusion:** the current study demonstrated that educational interventions can increase elementary school teachers' ADHD knowledge and self-efficacy. Whereas improving attitudes was little with no significant difference between pre/post assessment, our findings suggest that a brief professional educational intervention can be utilized to greatly increase teachers' ADHD knowledge, providing a cost-effective, practical solution to address this well-evidenced gap in teachers' training and knowledge about the disorder. Therefore, it is recommended that there is an urgent need to ensure that pre-service and in-service elementary school teachers have a sound knowledge of ADHD and maintain favorable attitudes toward teaching children with ADHD.

Key words: ADHD, Attitudes, Educational, KADDS, program, Teacher Efficacy Beliefs.

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INTRODUCTION

According to Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM5) Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental condition characterized by a pattern of inattention and/or hyperactivity impulsivity that interferes with quality of life, daily functioning, or development (American Psychiatric Association, [1]. ADHD is one of the most common childhood psychiatric disorders in the world [2]. The prevalence of ADHD is approximately 5.29% to 7.1% of children and adolescent [3, 4]. EL-Gendy, *et al.* [6] indicated that, few studies investigated the epidemiology of ADHD among Egyptian school children and reported that the prevalence was ranged between 6.5% and 7.9% in the previous studies while, they reported that the prevalence of ADHD among primary school children was 21.8% and 16.2% based on their study conducted in Al-Qalyubia Governorate primary school,

Egypt.. Although ADHD is most commonly diagnosed during the school years [5], onset of symptoms and neuropsychological impairments are also manifest in preschool-aged kids [5]. Boys are 2 to 3 times more likely than girls to have ADHD Polanczyk *et al.* [3, 4] and it is estimated that there is at least one child in every classroom with the diagnosis of ADHD every classroom with the diagnosis of ADHA [2].

Children who suffered from ADHD characterized by deficit in cognitive, behavior and emotion [7]. They also have a significance problem related to their hyperactivity and impulsivity [8]. According to DSM5, several types of ADHD were found including: ADHD predominantly inattentive presentation (ADHD-PI), ADHD predominantly hyperactive-impulsive presentation (ADHD-PHI) and ADHD combined presentation- inattentive and hyperactive- impulsive- (ADHD-C).

Unsurprisingly, the children are differing in way of behaviors, so the (DSM5) placed some criteria and symptoms to diagnose the child with ADHD. These symptoms should be six or more and should be present for at least six months. These criteria are: (a) makes careless mistakes/lacks attention to detail. (b) Difficulty sustaining attention; (c) does not seem to listen when spoken to directly ;(d) fails to follow through on tasks and instructions ;(e) Exhibits poor organization. (f) Avoids or dislikes tasks requiring sustained mental effort; (g) Loses when remaining seated is expected; (j) Experiences feelings of restlessness;(k) Has difficulty engaging in quiet, leisurely activities; (l) Talks excessively and blurts out answers; (m) Has difficulty waiting their turn and interrupts or intrudes on others American Psychiatric Association [1], and [9].

The American Psychiatric Association (APA), [1] reported the presence of high proportions of comorbidity and other functional impairments that composite the significant challenges of ADHD children. For instance, about 50% of children with combined-type ADHD have been found to have a comorbid diagnosis of oppositional defiant disorder and up to 70% have a learning disorder [10]. Additionally, as regard to ADHD academic achievements, it was reported that school students with ADHD are barred more frequently and get lower grades on standardized tests of academic ability [11]. Compared with other school students without ADHD, those with the disorder have been shown to require more specialist academic support and are also more likely to repeat a grade or leave school early [12]. More frequent disruptions have been reported when a child with ADHD is in the classroom [13] and teachers of children with ADHD also report higher levels of stress [14].

Therefore, multiple treatment interventions are designed to help manage the behavioral issues exhibited by children with ADHD. For instances, psychostimulant medications (e.g., methylphenidate, dextroamphetamine) are effective in reducing core ADHD symptoms [15, 16] with antidepressants and antihypertensive commonly used for stimulant non-responders. In addition to, parent training and school-based interventions which are classified as empirically validated psychosocial treatments for children with ADHD [17], and [14].

Accordingly, teachers play an essential role in supporting children with ADHD and are responsible for implementing the classroom management strategies that are designed to assist those students to achieve social, academic, and emotional success within the school setting [13]. Unfortunately, current evidence suggests that teachers may be inadequately prepared to support children with ADHD effectively, due to limited training [18] and low knowledge about the disorder [19, 20]. Studies conducted in Australia and other countries around the world has found much lower levels of

ADHD knowledge among teachers, commonly ranging between 15% and 62% Sciutto *et al.* [21]; (Youssef, Hutchinson, & Youssef [22]; Topkin *et al.* [13];(Alkahtani [23]; Anderson, *et al.* [24]; Guerra & Brown[19]. Overall, these very low to modest ADHD knowledge levels are unsurprising, considering research over the past 20 years has consistently found that the majority of teachers receive little, if any, training related to ADHD Bussing, *et al.*[25], Martinussen *et al.* [18], Jones & Chronis-Tuscano [17]. Deficiency of ADHD knowledge is identified as one of the greatest weaknesses in teachers being able to attend to the supplementary needs of ADHD students [14].

Considering the importance of knowledge and attitude towards ADHD among primary school teachers, are highly important factors not only for students but also for teachers. As, their attitudes will affect the way in which they behave towards students, negative behavior may result in negative outcome for students Punja *et al.* [15, 11]. In addition, studies have found that teachers' attitudes towards ADHD have a powerful impact on students' future achievements, social relationships, and self-esteem [14]. Barkley [2]; Loe & Feldman [11]. Unfortunately, studies have consistently found that teachers hold significantly more unfavorable attitudes towards students with ADHD compared to other students [15]; Lee & Witruk [23] and their surprising that relatively little research has been undertaken in this area[14].

Furthermore, teacher self-efficacy has also been recognized as an important element of successful teaching, and is defined as a teacher's beliefs in their capabilities to organize and implement strategies that bring about desired outcomes of student engagement and learning [26, 27]. Latouche and Gascoigne [14], reported in their study that, teachers with higher levels of self-efficacy tend to be more organized and willing to be more constant and responsive with students' of ADHD behavioral issues Moreover, pervious and recent studies indicate that the higher the self-efficacy among teachers the more willing to implement new methods to respond to students' diverse needs and more likely to use referral services of students with difficulties Latouche and Gascoigne [14] Bascuas [28] and [29]. On the other hand, low self-efficacy teachers tend to report more classroom troubles and higher levels of emotional exhaustion [30]. Previous studies in Nigeria ,Sri Lanka, and other countries have found that teachers who have negative attitude toward students with ADHD ,they will be self-criticizing and belittling in their classes due to lack of their knowledge and skills regarding how to manage the ADHD children [14]. In the same vein, Lasisi *et al.* [14] reported that teachers' level of education, years of experience, and training are among the factors that influence the behavior and attitude of teachers toward ADHD child.

Although no study has demonstrated that interventions that increase ADHD knowledge directly result in higher teacher self-efficacy, some correlational studies have shown an association between these two phenomena. Preliminary findings by Sciutto *et al.* [20] suggested a correlation between teacher self-efficacy and ADHD knowledge, and attitudes. This finding was supported in a recent study by Legato [31, 14], and [14] which specifically addressed this research question in primary school teachers. Because of the rising incidence and recognition of ADHD and the important role that teachers play in first identifying the condition, we sought to assess teachers' knowledge, self-efficacy and attitudes toward ADHD and we believe that, significance of this work lies not only in adding to the very limited data set on ADHD gaps but also in identifying that such information is critical in helping shape teacher training and raising the profile of the ADHD condition through the educational training of elementary school teachers in the Shebin Elkom city, affiliated to Menoufyia governorate, Egypt.

Aim of the study

This study aim to evaluate the effectiveness of an educational intervention on improving the elementary school teachers' knowledge, attitudes and self-efficacy toward ADHD children

Significance of the study

The prevalence of ADHD in Egypt was 21.8% and 16.2% as reported by EL-Gendy, *et al.* [6] from only Al-Qalyubia Governorate. The worldwide prevalence of ADHD in Arabic and African was very high and it ranges from 5.29% to 7.1% (5.4–8.7% in Africa, 6.24% in Jordan, 16.4% in Saudi Arabia Willcutt [4]; [32].To the best of our knowledge, the previous studies which were conducted in Egypt specially in small remote cities focused only in estimating the prevalence and assessing teacher knowledge, attitude, and their perception of their self-efficacy toward ADHD children, and little studies were conducted and used an educational intervention programs that aim improving elementary teachers' knowledge attitude and sense of self efficacy. Therefore, the researchers think about developing an educational interventions target the general education elementary school teachers and evaluate its effectiveness in improving their knowledge, attitudes

and self-efficacy toward inclusion of ADHD children in their regular classrooms.

Research questions

The present study was designed to answer the following questions:

Research question #1: What is the knowledge of Egyptian elementary teachers with regard to AD/HD as measured by the Knowledge of Attention Deficit Disorders Scale (KADDS)?

Research question #2: What attitudes do Egyptian elementary teachers have about the inclusion of students with ADHD-related behaviors as measured by the Teacher Attitude towards Inclusion Scale (TAIS)?

Research question # 3: How does the Egyptian elementary teachers perceived their self-efficacy to deal with the behavior of ADHD child in the class room as measured by self-efficacy scale?

Research question # 4: How well does teachers' knowledge of AD/HD correlate with their attitudes and self-efficacy for teaching students having ADHD?

Hypothesis

- The total score of Knowledge, attitudes and self-efficacy of elementary school teachers will be higher than their total score in pre assessment after conducting the interventional program.
- There is a significant positive correlation between post educational program scores of teachers' knowledge, attitudes and self-efficacy to include ADHD children in their regular classrooms
- There is a relationship between post educational program knowledge scores, attitudes and sense of self efficacy and selected personal characteristics of elementary schools' teachers
- The total score of Knowledge, attitudes and self-efficacy of elementary school teachers will not be affected after conducting the program.

Theoretical framework

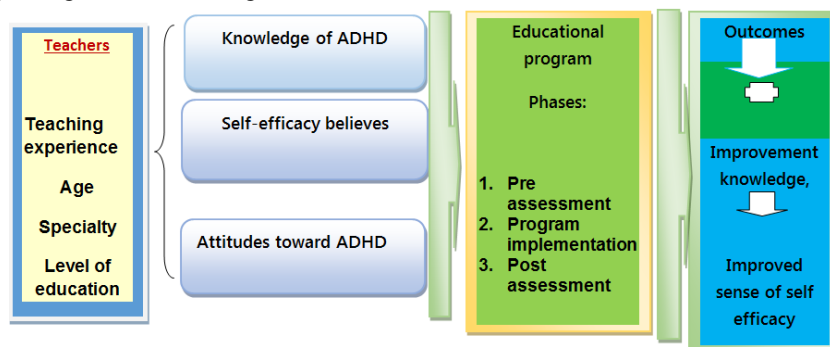


Fig-1: Represents the Theory of Planned Behavior [33] and the Theory of Self-efficacy [26]

Knowledge and Attitudes influence how we react to the behavior of other people. The reaction or attitudes of a teacher to the ADHD behavior is influenced by their professional experiences, knowledge and sense of self efficacy this relation between knowledge, attitude, and self-efficacy is replicated in Theory of Planned Behavior [33] and the Theory of Self-efficacy [26]. The current research evaluates the effectiveness of an educational program (outcome), where researchers assessed the level of knowledge and attitudes of the teachers towards students having ADHD and related behaviors. The Theory of Planned Behavior was utilized to assess teachers' attitudes towards the inclusion of students with AD/HD-related behaviors, as well as factors that influence these attitudes. On the other hand, the Theory of Self-efficacy was used to understand the relationships among teachers' efficacy beliefs related to teaching students with behavioral problems, their attitudes, and their knowledge of AD/HD. Thus, teachers need to have precise knowledge about ADHD, the confidence to teach and manage students with ADHD, and to hold favorable attitudes towards students with ADHD, which in turn will influence students' positive outcomes at school such as academic progress and emotional well-being [24, 11]. On this theoretical basis, the relationship between teachers' knowledge of AD/HD and their efficacy beliefs can be explained, as teachers with a better understanding of AD/HD and its associated behaviors, causes and appropriate accommodations are more likely to be able to maintain their sense of overall teaching competence compared to those with less knowledge of AD/. According to Planned Behavior Theory, changes in people's attitudes will be consistent with the nature of the new information they receive [35].

Subjects and Method

Design

This study utilized a quasi-experimental, quantitative, (pre/ post one group) research design to evaluate the effectiveness of the educational interventions On improving teachers ADHD knowledge ,attitudes and sense of self-efficacy.

Setting and Participants

Sample size calculation: the minimum sample size (100) was calculated according to the equation:

$$\text{Sample size} = \frac{Z_{1-\alpha/2}^2 P(1-P)}{d^2}$$

Where $Z_{1-\alpha/2}$ = is the standard normal variate at 5% type 1 error ($P < 0.05$); it is 1.96.

A convenient sampling technique was used to recruit 100 teachers from 2 elementary schools located at Shebin Elkom city and affiliated to ministry of education, Menoufyia Governorate, Egypt.

Tools of the study consist 4 main parts

Demographic and personal characteristics of the teachers was asked about: age, gender, marital status, level of education, years of experience and did they attend any training workshop about ADHD. The knowledge of Attention Deficit Disorders Scale (KADDS) tool: this tool was used to measure teachers' understanding and perceptions of ADHD Sciuotto, *et al.* [21]. The scale consists of 36 items. The responses were indicated as 'incorrect', 'correct' and 'don't know' responses. Correct responses were indicated with a '1', while incorrect and don't know responses were indicated with a '0'. The KADDS format allows for the differentiation between what teachers do not know from their misperception of ADHD Sciuotto *et al.* [21]; Soroa *et al.* [36]. The KADDS consists of three subscales. The first subscale measured general information related to ADHD, using 15 items. Items on the general knowledge subscale included: "Attention Deficit Disorder occurs in approximately 15% of all school-aged children", and "it is possible for an adult to be diagnosed with ADHD" [21]. The second subscale measures symptoms/diagnosis of ADHD using nine items. Items on the symptoms/diagnosis knowledge subscale included "Symptoms must not be present before age seven to be diagnosed with ADHD" and "children diagnosed with an attention deficit disorder tend to have poor concentration" [21]. The third subscale measured knowledge of the treatment of ADHD, using 12 items. Items on the treatment knowledge subscale included "Stimulant medication increases concentration" and "Electroconvulsive Therapy (ECT) is an effective treatment for Attention Deficit Disorder" Sciuotto, Terjesen& Frank, [21]. The correct answer of questions (3,4,5,6,8,9,10,13,15,16,17,20,21,25,26,31,32,and 33) is true and the correct answer of questions (1,2,7,11,12,14,18,19,22,23,24,27,28,29,30,34,35,and36) is false. The total score for all questions related to knowledge was 36 points which represent 100% and categorized into three levels as the following: poor if knowledge less than 60%, average knowledge from 60- >75% and good if knowledge more than <75%.

The Teacher Attitude towards Inclusion Scale (TAIS) developed by [37] was used in the present study to assess teachers' attitude toward having students suffering from ADHD in their regular classrooms. The subjects were given a short scenario, which show that their principle informed them that they will include student who have special needs in their classrooms. The scale composed of 17 pairs of adjectives refer to teachers possible feeling toward including ADHD child in their classroom, and the teachers' answer will be rated on 4 points Likert-type scale. The scale was rated for each feeling from 1 - 4 as 1 = "accepting" to 4 = "opposing" or 1 = "comfortable" to 4 = "uncomfortable". The questionnaire includes 17 items with four response scale. The minimum score is 17

(negative attitude), and the maximum score is 68 (positive attitude).

The scoring system about teachers' total attitude was considered positive if the score was more than 52%, ambivalent attitude if the score $35 \leq 52\%$, and negative attitude if score $17 \leq 34\%$

In the current study, adopted planned hypothetical vignettes which divided into two parts, the first part describes students who meet the DSM-V criteria for AD/HD inattentive subtype (AD/HD-I) in primary school. The second part represent students with behaviors related to AD/HD- hyperactivity/ impulsive subtype (AD/HD-HI). The teachers were given the vignettes to read it and respond by expressing their feeling. Alamari [38] used the scenario and added to each vignette: "suppose that your school decides to include (Salem or Salma) in your classroom". This addition was used in the current study as the tool was used with sample of Egyptian teachers.

Teacher Efficacy Beliefs Scale (TEBS) Teachers' perceptions of their efficacy for instructing and managing students with behavioral difficulties were measured using the Teacher Efficacy Beliefs Scale (TEBS). This 11-item scale was designed by Brownell and Pajares [39] to explore teachers' efficacy beliefs to instruct and manage students with learning and behavioral difficulties. The current study was adopted the only 8 items used by Alamari [38], in his study, as he excluded the three items which related to students with learning difficulties because his study and the present study mainly focuses on students who display behavioral difficulties associated with AD/HD. Such exclusion is consistent with the guidelines provided by Bandura [40], who suggested that instruments of self-efficacy should not be too general, but should be context-specific; that is, in order to achieve accuracy, self-efficacy needs to be assessed on the basis of particular skills or skill sets. The possible responses to the items in the TEBS scale range from 1 to 6, with a score of 1 indicating that the respondent can do "nothing" and a score of 6 indicating that the respondent can do "a great deal". Scores from all of the items are summed to obtain a total score, ranging from 8 to 48 and coded such that higher scores are indicative of higher levels of self-efficacy. Each item starts with the phrase "how much can you do to ...", and some examples of the items are as follows: "How much can you do to keep students with behavioral problems on task with difficult assignments?" and "How much can you do to individualize learning for students with behavioral problems?" Brownell and Pajares [39], who used this measure in their study, reported a reliability coefficient of .90, which is excellent.

All adopted English instruments versions were translated into Arabic language and back translated into English language as the Arabic is the mother tongue of

Egyptian teachers. Back translation aimed at verifying whether the translation covers all aspects of the original English version of the questionnaire or not.

Validity and Reliability

To ensure the content validity of the final translated Arabic version of the questionnaires, were evaluated by a panel of experts who were selected based on their qualifications and experience in nursing research and education. The internal consistency (Cronbach's alpha coefficient) of the scales of TAIS, TEBS, and KADDS were .82, .81, and .89, respectively. This alpha score indicates good reliability of the instrument and similar results were found locally [41] and internationally Alkahtani, [23]. All the Cronbach's alpha values were higher than .7, and thus the questionnaires were judged to be adequate for use in the present study.

Pilot study

A pilot study was tested on a sample of 10 teachers who were excluded from the participant sample for the main study, as recommended by Pett, Lackey, and Sullivan [42]. The aim of this pilot was to identify the feasibility and clarity of the questionnaires, and the time required for completing the questionnaires which was 20 – 25 minutes. For the pilot study, the internal consistency reliability was calculated by using Cronbach's alpha coefficient, which is the most widely used assessment of internal consistency.

Data collection procedure

Once the proposed study approved from the Educational Administration of Shebin Elkom, affiliated to Menoufyia Governorate. Ministry of Education, Egypt. A letter was submitted to the principals of the two selected schools for arrangement and permission to start data collection. The Data were collected during the fall academic year 2018/2019. The participants in the Quasi-experimental group were asked to sign the informed consent form before starting the program, and to fill the questionnaires before, and after the educational program. Because of the big (100) numbers of teachers, the researchers divided the teachers into 5 groups each was 20 to facilitate the discussion and giving enough time for answering the questions of teachers and allowing them to re-demonstrate the presented behavioral interventions. The general aim of the educational program was improving the elementary teachers' knowledge, attitudes and sense of self efficacy toward inclusion of ADHD children in their regular classes.

The program was developed based on extensive review of literature. After the conduction of the program the teachers were expected to:

- Identify the symptoms, and clinical manifestations of ADHD children.

- Recognize risk factors, causes of ADHD, and the treatment modalities both pharmacological and nonpharmacological.
- Describe the warning signs of ADHD appear on students having ADHD risk factors.
- Respond effectively to the children' when exhibiting ADHD behaviors.
- Apply the different professional behavioral interventions to manage ADHD including (role of teachers in early detection of ADHD children, how they can do referral.
- Use different ways of interactions with the families of ADHD children besides the reinforcement of using behavioral strategies such as; positive and negative reinforcement, home-based contingencies,
- Apply physical arrangement and restructure of the class room environment, and use varied presentations and format of learning materials).

The program was conducted at 5 consecutive days since the number of teachers was divided into 5 subgroups. Each group was contacted for 5 hours divided as follow:

Half an hour was given for fulfilling the pretest questionnaires.

- **The First session** was warming up and stating the program objectives and 90 minutes was spent in discussing the knowledge and attitude toward inclusion of ADHD children including: ADHD definition, causes, symptoms and clinical manifestation.
- **The second session** (2 hours) had the treatment modalities (pharmacological and nonpharmacological). The ADHD behavioral management, discussed the role of teachers in early detection of ADHD children, how they can do referral and different ways of interactions with the families of ADHD children besides the reinforcement of using behavioral strategies such as; positive and negative reinforcement, home-based contingencies, structure and physical arrangement of the class room environment, and use of varied presentations and format of materials.
- **3rd sessions** after finishing the learning session, last hour was divided into 2 equal parts, half an hour was for discussion, questions and feedback of the subjects and the other for fulfilling questionnaires after implementing the program.

Methods of instructions

The sessions were presented the teachers with booklets, brochures and audio-visual materials designed

for management of ADHD. Role play, modeling, demonstration and re-demonstration were used to teach the behavioral interventions.

Ethical Considerations

An official approval was received from the Educational Administration of Shebin Elkom, affiliated to Menoufyia Governorate. A letter of approval was submitted to the principles of the selected schools. Teachers were informed about the purpose of the study, and that their participation is voluntary and they can withdraw from the study at any time without any penalty. A written consent was obtained from all subjects. Anonymity and confidentiality were ensured by using identification codes on the questionnaires that facilitated individual comparison of pre-and post-educational program responses.

Data management and statistical analysis

The data were coded and analyzed using SPSS version 20.0. Data were presented using descriptive statistics for discrete variables in the form of frequencies and percentages, And for interval and ratio variables in the form of means and standard deviations. A paired t-test was used to analyze the total scores of the participants' responses on the pre-test and the post-Test (i.e., before and after the program). t paired was applied for comparison between the not normally distributed quantitative data at interval for the same group. Chi- squared test (χ^2) was used to study association between two qualitative variables. P-value of (<0.05) was considered statistically insignificant. P-value of (<0.05) was considered statistically significant. P-value of (≤ 0.001) was considered statistically highly significant.

RESULTS

Table (1) showed that, more than half (51%) of the studied sample were aged between 30<-40 years with mean age of total $M \pm SD$ 40.99 ± 9.7 years old. As regards their education, the vast majority (95% & 96%) of studied male and female samples were BA/ BS of education level. In relation to their specialty, majority (96%) was in general teaching. As regard to the relationship between demographics, the table indicated the presence of highly statistically significant difference regarding age, grade taught and experience between male and female studied samples at ($P < 0.05$) While there was no statistically significant difference regarding level of education and their specialty at ($P < 0.05$).

Table-1: Distribution of the study sample according to their Socio-demographic characteristics of. (N = 100)

Demographic characteristics	Gender				Total	
	Male		Female		No.	%
	No.	%	No.	%		
Age: 20- 30 years	4	4.0	3	3.0	7	7.0
31<- 40 years	15	15.0	36	36.0	51	51.0
41<-50 years	12	12.0	10	10.0	22	22.0
51<-60 years	15	15.0	5	5.0	20	20.0
Mean ± SD	40.99±9.73					
X ²	8.163					
Sig.	0.004 (P<0.05)					
Education : BA/BS	44	44.0	51	51.0	95	95.0
Diploma	2	2.0	3	3.0	5	5.0
X ²	.076					
Sig.	0.783(P>0.05)					
Grade taught:						
• pre-grade 1	10	10.0	29	29.0	39	39.0
• Grade 2-3	20	20.0	18	18.0	38	38.0
• Grade 4-6	16	16.0	7	7.0	23	23.0
X ²	11.968					
Sig.	0.001(P<0.05)					
Experience : 0 - 5	7	7.0	8	8.0	15	15.0
5< - 10	7	7.0	22	22.0	29	29.0
10< -15	9	9.0	13	13.0	22	22.0
15< - 20	7	7.0	7	7.0	14	14.0
20-	16	16.0	4	4.0	20	20.0
X ²	15.21					
Sig.	0.004(P<0.05)					
Specialty: General	46	46	50	50	96	96.0
Specific	0	0.0	4	4.0	4	4.0
X ²	3.549					
Sig.	0.060 (P>0.05)					
Total	46	46.0	54	54.0	100	100

Table (2) illustrated that, the majority of studied samples responded with correct answers regarding the KADDs scale of general information, symptoms and treatment modalities in post educational interventions except for item of general information

“Children with ADHD are more distinguishable from children without ADHD in a classroom setting than in a free play situation” as only 31% of the respondents indicated correct answer compared with only 18% in pre educational interventions.

Table-2: Distribution of studied subjects on the most common correct responses on the KADDs (pre and post comparison) (N=100)

Ques. No	Questions	subscale	Correct response pre/%	correct response post/%
9	Children with ADHD often fidget or squirm in Their seats. (True)	S	11	93
3	Children with ADHD are frequently distracted by extraneous stimuli. (True)	S	5	91
13	It is possible for an adult to be diagnosed with ADHD. (True)	G	16	93
26	Children with ADHD often have difficulty Organizing tasks and activities. (True)	S	12	93
10	Parent and teacher training in managing a child With ADHD are generally effective when combined with medication treatment. (True)	T	21	92
16	Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity. (True)	S	9	82
8	Antidepressant drugs have been effective in reducing symptoms for many children with ADHD. (true)	T	13	92
15	Side effects of stimulant drugs used for treatment of ADHD may include mild	T	6	93

	insomnia and appetite reduction (true)			
20	In severe cases of ADHD, medication is often used before other behavior modification techniques are attempted.(true)	T	18	92
21	In order to be diagnosed as ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).(true)	G	10	95
25	Stimulant drugs are the most common type of drug used to treat children with ADHD.(true)	T	25	92
31	Children with ADHD are more distinguishable from children without ADHD in a classroom setting than in a free play situation. (true)	G	18	31
32	The majority of children with ADHD evidence some degree of poor school performance in the elementary school years.(true)	G	16	95
33	Symptoms of ADHD are often seen in children without ADHD who come from inadequate and chaotic home environments (true)	S	16	89

Table (3) presented that, the majority of studied samples respondent correctly answers in post assessment for items of KADDs general information, symptoms and treatment modalities except for the item of general information “Children with ADHD are

typically more compliant with their fathers than with their mothers. (True) only 36% respond correctly in post assessment compared with only 6% in pre assessment of educational intervention.

Table-3: Distribution of studied subjects on the most common Incorrect responses on the KADDs (pre and post comparison) (N=100)

Ques. no	Questions	subscale	In Correct response pre/%	Correct response post/%
1	Most estimates suggest that ADHD occurs in approximately 15% of school age children. (False)	G	7	53
2	Current research suggests that ADHD is largely the result of ineffective parenting skills.(false)	G	17	91
5	In order to be diagnosed with ADHD, the child's symptoms must have been present before age seven. (True)	S	13	69
4	Children with ADHD are typically more compliant with their fathers than with their mothers. (True)	G	6	36
7	One symptom of children with ADHD is that they have been physically cruel to other people.(false)	S	17	88
11	It is common for children with ADHD to have an inflated sense of self-esteem or grandiosity.(false)	S	28	86
12	When treatment of a child with ADHD is terminated, it is rare for the child's symptoms to return.(false)	G	18	90
14	Children with ADHD often have a history of stealing or destroying other people's things. (false)	S	18	93
18	Individual psychotherapy is usually sufficient for the treatment of most children with ADHD. (false)	T	16	91
19	Most children with ADHD "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.(false)	G	13	91
22	If a child with ADHD is able to demonstrate sustained attention to video games or TV for over an hour, that child is also able to sustain attention for at least an hour of class or homework. (false)	G	20	92
23	Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD. (true)	T	21	92
24	A diagnosis of ADHD by itself makes a child eligible for placement in special education. (false)	T	9	90
27	Children with ADHD generally experience more problems in novel situations than in familiar situations. (False)	G	13	67
28	There are specific physical features which can be identified by medical doctors (e.g., pediatrician) in making a definitive diagnosis of ADHD. (false)	G	6	88
29	In school age children, the prevalence of ADHD in males and females is equivalent. (false)	G	8	90
30	In very young children (less than 4 years old), the problem behaviors of ADHD children (e.g. hyperactivity, inattention) are distinctly different from age appropriate behaviors of children without ADHD. (false)	G	19	93
34	Behavioral/Psychological interventions for children with ADHD focus primarily on the child's problems with inattention. (False)	T	9	96
36	Treatments for ADHD which focus primarily on punishment have been found to be the most effective in reducing the symptoms of ADHD. (false)	T	16	89

Table (4) indicated that, less than half of studied samples respondent Don't know responses was (46%,45%,41%and 31% respectively) during pretest.

While, the minority of studied sample were indicate they don't know responses after post educational intervention.

Table-4: Distribution of studied subjects on the most common don't know responses on the KADDS (pre and post comparison) (N=100)

Ques. No	Question	subscale	Don't know response pre/%	Don't know response post/%
35	Electroconvulsive Therapy (i.e., shock treatment) has been found to be an effective treatment for severe cases of ADHD. (False)	T	45	5
6	ADHD is more common in 1st degree biological relatives (i.e., mother, father) of children with ADHD than in the general population. (True)	G	21	3
4	Children with ADHD are typically more compliant with their fathers than with their mothers. (True)	G	31	3
17	Symptoms of depression are found more frequently in children with ADHD than in children without ADHD. (True)	G	46	8

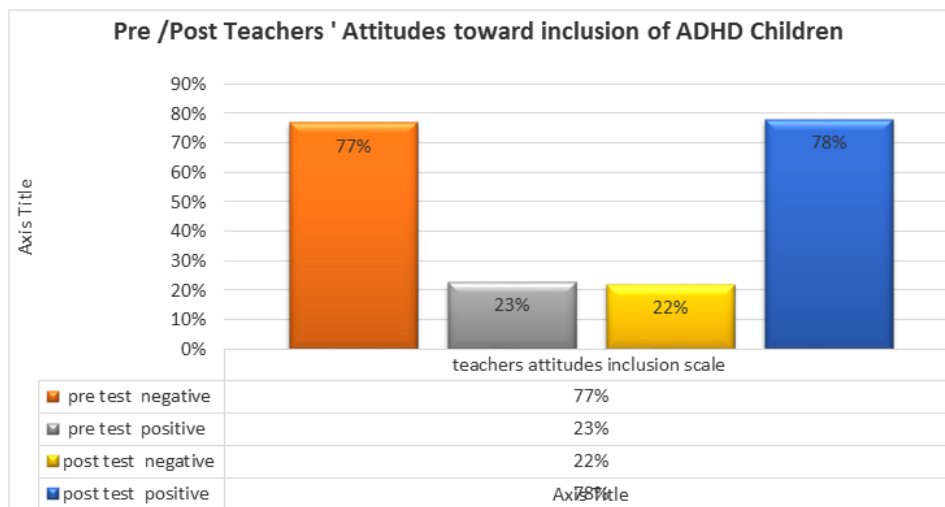


Fig-1: Illustrated that 77% of studied samples had negative attitude at pre-test compared with 23% had positive attitudes toward inclusion of ADHD children in their regular classrooms. While 78% of studied samples had positive attitude posttest. The minimum score is 17(negative attitude) the maximum score is 68 (positive attitude)

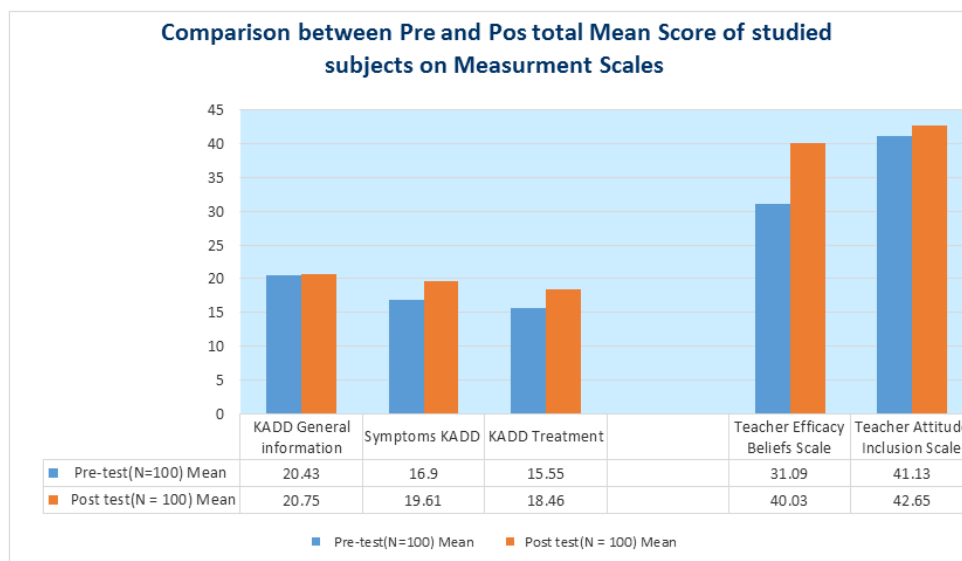


Fig-2: exhibited that, the total mean of KADD general information, symptoms, and treatment of ADHD in pre was (20.43) compared with (20.75), (16.9) compared with (19.61) and (15.55) compared by (18.46) in post assessment of ADHD respectively. While their efficacy beliefs was (31.09) compared with (40.03) in post assessment. On the other hand slight changing was found between pre attitudes (41.13) compared with 42.65 in their post assessment with no significant difference $p \leq 0.05$.

Table (5) showed that there was a highly statistical significant difference between total mean score of knowledge of Attention Deficit disorders Scale (KADDS) related to general Information symptoms and treatment among the study group pre\post intervention (at p-value < 0.000. Moreover there was highly statistical significant difference between total mean

score of Teacher Efficacy Beliefs Scale Pre (31.09±6.94) compared with post (40.03±4.07) at $p \geq 0.05$. On the other hand, slight change in teacher attitudes inclusion was reported with no significant difference between pre\ post educational interventions at $p \geq 0.05$.

Table-5: Comparison between pre and posttests regarding total mean and standard division scores on knowledge of Attention Deficit disorders Scale (KADDS), self-efficacy and attitudes of teachers

knowledge of Attention Deficit disorders Scale	Pre-test (n=100)	Post test (n=100)	t	P value
	Mean ±SD	Mean ±SD		
General information	20.43±4.96	20.75±2.79	0.638	0.008
Symptoms	16.52±3.128	19.61±5.3	5.621	0.000
Treatment	15.55±1.229	18.46±4.49	6.429	0.000
Teacher Efficacy Beliefs Scale	31.09±6.94	40.03±4.07	-11.440	< 0.000***
Teacher Attitude Inclusion Scale	42.13±4.08	41.65±4.78	.949	.345

This table (6) described that there was a significant positive correlation among total score of Teacher Attitude Inclusion Scale and Teacher Efficacy Beliefs Scale and total score of knowledge of Attention

Deficit disorders Scale (KADDS) among study group in pre and post intervention except for general information of ADHD knowledge subscale in post educational intervention at ($p 0.01$).

Table -6: Correlation between total scores of Teacher Attitude Inclusion Scale and knowledge of Attention Deficit disorders Scale (KADDS) among the study group pre and post intervention (N =100)

knowledge of Attention Deficit disorders Scale (KADDS)Table 2	Teacher Efficacy Beliefs Scale				Teacher Attitude Inclusion Scale			
	Pre test		Post test		Pre test		Post test	
	R	P value	R	P value	R	Value	R	P value
General information	-0.384	0.000	-0.167-	0.096	0.334	0.001	-0.130	0.99
Symptoms	-0.342	0.000	-0.340	0.001	0.300	0.002	.311	0.05
Treatment	-0.284	0.004	-0.133-	0.188	.390	0.000	0.486	0.004

Table (7) illustrated that, there was highly statistical significant difference among age groups, level of education and teaching experience at $p 0.002, 0.004,$

and 0.00 respectively. While there is no significant relationship between teachers' gender, grades they taught and their specialty at $p < 0.05$.

Table-7: Relationship between General information and socio-demographic characteristics of the study group pre intervention (n=100)

Socio-Demographic characteristics	General information (pre-test)n=100			Total	F	P value
	False	True	Do not know			
Age:						
20-30 years	2	0	5	7	20.984	0.002**
30<- 40 years	21	4	26	51		
40<- 50 years	13	2	7	22		
50<-60 years	17	0	3	20		
Gender :					3.472	0.176
Male	29	2	15	46		
Female	24	4	26	54		
Education :					11.223	0.004**
BA/BS	52	4	39	95		
Diploma	1	2	2	5		
Grade taught:						
Pre-grade 1	17	4	18	39	5.326	0.255
Grade 2-3	20	2	16	38		
Grade 4-6	16	0	7	23		

Experience :	0 - 5	5	4	6	15	28.379	0.000**
	5< -10	13	0	16	29		
	10< -15	10	0	12	22		
	15< - 20	8	2	4	14		
	≥ 21	17	0	3	20		
Specialty:	General	22	2	12	36	1.523	00.467
	Specific	31	4	29	64		

Table (8) described the correlation between teachers' pre/post self-efficacy, attitudes and their age and teaching experiences. The table showed that teachers' self-efficacy beliefs in pre assessment has significant relationship with their age and teaching experiences ($r = .304, .240$ and P value = 0.002 and 0.016) respectively while there is no significant correlation was found between post self-efficacy

assessment, teacher's age, and teaching experiences ($r = 0.07, -0.073$ at $p = 0.05$). In addition to a significant correlation was found between post self-efficacy and teachers' attitudes (0.043 , and 0.154) respectively at $p = 0.05$. Additionally, a significant correlation was found between pre and post attitudes with teacher's age and their teaching experiences at $p = 0.05$

Table-8: Correlation between teachers' pre/post self-efficacy, attitudes, and their age and teaching experiences (N=100)

Variables		Self-efficacy pre	Self-efficacy post	age	experience1	Attitude pre	Attitude post
Self-efficacy pre	Pearson Correlation	1	0.037	.304**	.240*	-0.114	.353**
	Sig. (2-tailed)	0	0.715	0.002	0.016	0.261	.000
Self-efficacy post	Pearson Correlation	0.037	1	0.078	-0.073	0.043	0.154
	Sig. (2-tailed)	0.715	.004	0.44	0.473	0.672	0.126
age	Pearson Correlation	.304**	0.078	1	.866**	-.255*	0.091
	Sig. (2-tailed)	0.002	0.44	.545	.006	0.01	0.37
experience1	Pearson Correlation	.240*	-0.073	.866**	1	-.368**	-0.007
	Sig. (2-tailed)	0.016	0.473	.083	.041	.005	0.942
Attitude pre	Pearson Correlation	-0.114	0.043	-.255*	-.368**	1	.357**
	Sig. (2-tailed)	0.261	0.672	0.01	.002	.163	.010
Attitude post	Pearson Correlation	.353**	0.154	0.091	-0.007	.357**	1
	Sig. (2-tailed)	.000	0.126	0.37	0.942	.848	.370
**. Correlation is significant at the 0.01 level (2-tailed).							
* . Correlation is significant at the 0.05 level (2-tailed).							

DISCUSSION

The present study was designed to examine the effectiveness of an educational intervention on improving teachers' knowledge, attitudes and sense of self-efficacy toward the inclusion of students with AD/HD-related behaviors. In addition, the study investigated the relationships among teachers' attitude, knowledge, efficacy beliefs for teaching students with ADHD behavioral problems. Besides, the relationship between teachers' background and personal information including teacher age, gender, their

teaching experiences and level of education and their specialty about students with AD/HD-related behaviors.

The findings of the current study have confirmed our proposed hypothesis that the educational intervention was significantly impact teacher knowledge on ADHD, supporting previous reports that demonstrate the effectiveness of brief interventions to improve teacher knowledge about ADHD [47]. The results revealed that, there was a highly statistical significant difference between mean score of knowledge of Attention Deficit disorders Scale

(KADDS) related to general information, symptoms and treatment among the study group pre/post intervention at p -value < 0.000 .

This result is congruent with the study of Latouche and Gascoign [14]; Aguiar *et al.* [29] and Youssef *et al.* [43]. To the best of our knowledge, this kind of initiative in developing countries for ADHD in the literature is very limited. As, Farahat *et al.* [8] reported that the prevalence of ADHD based on the DSM-IV criteria was found to be 6.9% among primary school children of Menoufia governorate, Egypt and indicated that the prevalence is higher than the results of another study (5.1%) done in the same governorate in 2007 by Elwan *et al.*[11]. Therefore, the intervention was highly efficacious on improving ADHD knowledge. The results indicated that, the teachers' knowledge went from low to high knowledge levels, as a result of educational intervention.

As regard to the attitudes toward inclusion of ADHD students, the results reported the difference between pre and post change in attitudes among studied subjects (figure 1) as 78% holding negative attitudes in pre assessment became 87% having the positive attitudes in post intervention program. In fact the results from the questionnaires indicated that Egyptian primary teachers have generally positive attitudes towards the inclusion of students with AD/HD-related behaviors. The total mean score in pre was 41.65 ± 4.78 compared with 42.13 ± 4.08 in post assessment as the teachers rated themselves as having a positive attitude. Despite, there was a minor increase in attitudes total mean score of the teacher in post assessment but, with no significant difference between pre and post assessment. These results were supported by the study done by (Alamari [38], who reported from his qualitative study that, most of the interview participants had positive attitudes about including students with AD/HD-related behaviors in their regular classrooms. As well, Bhasin, Srinivasan, & Deaver [45], reported that, teaching programs were effective in improving knowledge and attitude among primary school teachers regarding ADHD. Similarly, Ali- Alabd, Mesbah, & Alboliteeh [44] reported that their educational program was significantly impact the attitudes of teachers in pre assessment with a highly statistical significant differences between pre and post interventions total attitude score of the studied teachers working at Hail city. On the other hand, the reported findings from current study was contradicting the findings of several recent studies, which have indicated that teachers have negative attitudes towards including students with AD/HD-related behaviors in mainstream classes [46,47].

Yosef *et al.* [47] also examined teachers' attitudes towards children with AD/HD and found that 152 out of the 196 teachers (77.5%) believed that students with AD/HD should be placed in special education settings and that such a setting would be more

favorable than a regular classroom. The most negative attitudes towards including students with AD/HD in regular classrooms were yielded in a study conducted by Yoo *et al.* [46] with 164 preschool teachers in South Korea. Their findings indicated that, 97.6% of teachers thought children with AD/HD should be taught in special rather than regular education classrooms. Similarly, Nur and Kavakci [46], who explored the attitudes towards inclusion of 87 elementary school teachers in Turkey, found that most respondents (93.1%) preferred special rather than general education placements for students with AD/HD.

It seems that there is a discrepancy between the results of this study and the findings of previous research which may be attributable to two factors. First, differences in the populations being studied. For example, the findings indicated a belief that students with AD/HD-related behaviors are often creative, and that their creativity should be encouraged and their behaviors accommodated in order to enhance their learning. While other cultures may hold a belief that those children's have challenging behaviors and not necessarily to be included in regular classroom of general education. Second, discrepant findings may be due to methodological differences as all these studies were assessed with only one item (or question). In contrast, the current study used a multiple-item measure of attitudes as recommended in the Theory of Planned Behavior for Ajzen [48] who noted that, a single-item measure of attitude may produce unreliable data [49].

As regard to self-efficacy, (Table (5) illustrated that there was highly statistical significant difference between mean score of Teacher Efficacy Beliefs Scale among group pre/posttest. Similar findings have been reported in previous research. Alamari [38, 50]. Furthermore, Latouche and Gascoigne [14] reported that, their educational intervention was successful in increasing teachers' self-efficacy. Moreover, the finding was also consistent with previous researches conducted by [31] and Alamari [38].

Another reported finding was the more the positive attitude held by the participants, the more the sense of self-efficacy was present among them (table 5). In the same vein, Weisel and Dror [50] examined the effects of 139 primary teachers' self-efficacy on their attitudes towards inclusion. The authors found that teachers who were more efficacious had more favorable attitudes towards inclusion. Self-efficacy was found to be the most significant variable influencing these attitudes. The relationship between attitudes and efficacy beliefs can be explained by Bandura's [51] self-efficacy theory. This theory posits those perceptions of efficacy influence individuals' thought patterns, emotional reactions, and the choices they make [52]. People with high levels of efficacy tend to approach difficult tasks with feelings of serenity. Conversely, people with low levels of efficacy tend to think that

situations are tougher than they really are and thus may choose to avoid such challenging situations [53] & Alamari, [38]. This implies that teachers who judge themselves as efficacious in dealing with and teaching students with ADHD-related behaviors are more likely to be positive about the inclusion of these students in regular classrooms and that teachers who doubt their capabilities tend to believe that such interactions are difficult and demanding and thus may be less willing to accept such students in their classrooms.

As regard to the relationship between the teachers' demographic and personal characteristics, the results reported that studied demographic variables including the teachers' years of experiences, type of school, grade taught and training institution had no significant correlation with the knowledge score. Similar results were obtained by Rodrigo *et al.* [43] in their study as they found that, only special training in ADHD was an important factor affecting level of knowledge and attitudes. Greatly enforce that this study may be the first interventional study conducted at this governorate as the teachers seem that its first time to listen about the topic despite some of them face some form of students with ADHD behavior and they respond by just called the parent of the child without any scientific intervention from the teachers side. The current study indicates that, age of teachers had significant impact on their self-efficacy with no difference between pre and post intervention related to knowledge and attitudes. The interpretation of this finding might be related to the total mean score of age was (40.99 ± 9.73) . The results indicate that, the newly graduate teachers were more knowledgeable about ADHD than older teachers.

Recently, the ministry of higher education was added courses related to teaching of children with special learning disabilities as a part of the curriculum of faculty of art and education. Therefore, the younger teachers who were newly graduated indicated their interest in learning more than older teachers who neither knowledgeable nor holding the positive attitudes. In fact it was reported that, a person with deficient knowledge may be cautious and seek information, but a person who holds an incorrect view may not seek additional information and may recommend inappropriate advice. Many teachers in this study not only understood that their knowledge was poor, they also identified responsibility in detecting, treating ADHD and providing extra educational assistance to those children. This is an encouraging sign for the future and emphasizes the importance of providing teachers with preservice or in-service training on common childhood psychological problems including ADHD. Therefore, teachers need to know how to apply their knowledge in order to have successful results and should have positive attitude with child who diagnosed with ADHD to act correctly and be away from negative evaluation because teachers' attitudinal practice may

interfere with the ability to evaluate and manage the child behavior [14].

CONCLUSION

The results of the current study demonstrated that educational interventions can increase elementary school teachers' ADHD knowledge and self-efficacy. Whereas improving attitudes were little with no significant difference between pre/post assessment. Therefore, the findings of the current study could suggest that a brief professional educational intervention can be utilized to greatly improve teachers' ADHD knowledge, and providing a cost-effective, practical solution to address this well-evidenced gap in teachers' training and knowledge about the disorder. In addition, the results indicated that, teachers' knowledge was inadequate regarding the symptoms, causes and treatment modalities of ADHD but they have reasonable information about ADHD general characteristics. As regard to the attitude components, the results of the current study showed that in pre assessment, teachers hold negative or ambivalent attitudes toward teaching children with ADHD or including them in their regular classes. While, a post assessment results indicated that, training and educational interventions help in raising teachers' awareness for developing favorable attitudes and beliefs. As regard to the sense of self-efficacy, the results illustrated that there was highly statistical significant difference between mean score of Teacher Efficacy Beliefs Scale among group pre/posttest. In addition to, the positive significant correlation between knowledge, self-efficacy and attitudes of teachers toward inclusion of ADHD in their regular classrooms. As, the high the knowledge level, the more the positive attitude held by the participants, the more the sense of self-efficacy. On the other hand, the current study indicated that, age of teachers, and teaching experiences had significant impact on their self-efficacy beliefs with no significant difference between pre and post intervention in relation to their knowledge and attitudes.

RECOMMENDATION

- Given the likelihood of high prevalence of children with ADHD, combined with the pivotal roles played by teachers who instruct children with ADHD, it is important that pre-service and in-service teachers have a sound knowledge of ADHD to maintain favorable attitudes toward teaching children with ADHD.
- Presence of psychologist in each school is an important issue for regular training and early discovery of ADHD and its related behaviors disorders
- Future research should be directed toward studying why unfavorable affect and beliefs develop (components of attitudes) despite, at the same time positive behaviors are reported. This would aid in understanding of the attitudes toward teaching children with ADHD and foster development of

preventative measures during earlier childhood and adolescent.

Research practice implications

- Health and/or Ministry of education should regularly endorse a special course on ADHD for teachers working in primary schools.
- Educational curriculum should involve special course of educational and learning disabilities and should be a part of the curriculum in faculty training.
- Using media and technology in presenting these educational programs on television and radio may be highly effective as they were the most common source of information for all populations with different socioeconomic and community sectors.
- Health professionals should provide baseline information about ADHD when presenting information about risk factors and warning manifestations which might help in decreasing the prevalence of ADHD among pre and school age children.
- Involvement of parents in teaching program specially in pre-marital parental counselling as a preparation to have healthy children as a step toward primary prevention of ADHD.

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