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The Effect of an Educational Program for Teachers regarding Attention Deficit Hyperactivity Disorder among Primary School Children

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Abstract: **Background: Attention deficit/hyperactivity disorder is a common childhood neurodevelopmental disorder. Primary school teachers play an important role in the assessment of academic and behavioral problems of children due to their closely observation of children during the school day. Aim: This study aimed to evaluate the effect of an educational program for teachers regarding attention deficit hyperactivity disorder among primary school children. Research design: A quasi-experimental research design was utilized. Setting: this study was conducted at 9 Primary Schools at Beni-Suef governorate. Sample: Multistage random sample of 225 teachers. Tools: two tools were used. Tool I): A structured Interview Questionnaire covered three parts. Part I: demographic characteristics of the teachers. Part II: teachers' knowledge about attention deficit hyperactivity disorder. Part III: Teachers' reported practice related to attention deficit hyperactivity disorder. Tool II): Teachers' attitude regarding the student with attention deficit hyperactivity disorder. Results: 81.8% of studied teachers had poor knowledge level about attention deficit/hyperactivity disorder at preprogram which improved to 94.2% of them had good knowledge level at post program, while 86.7% of them had inadequate reported practices level regarding attention deficit/hyperactivity disorder at preprogram which improved to 90.7% of them had adequate reported practices at post program and 85.8% of them had negative attitude toward students with attention deficit/hyperactivity disorder at preprogram, which improved to 95.6% of them had positive attitude toward students with attention deficit/hyperactivity disorder at post program. Conclusion: there was highly statistically significant positive correlation between total knowledge, reported practices and attitude at ($P \leq 0.01$) at post implementation of the educational program. Recommendations: Continuous health education programs should be developed and implemented for teachers about attention deficit/hyperactivity disorder.**

Keywords: **Attention Deficit Hyperactivity Disorder, Health educational program, Primary School Children, Teachers.**

1. INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is the most pervasive mental disorder affecting 3% to 5% of school-aged children with prevalence rates increasing significantly over the past two decades. ADHD children present a pattern of inattention, hyperactivity and/or impulsivity. Inattention symptoms include difficulty with sustained attention, being unable

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to complete tasks, not following instructions and inability to complete duties and schoolwork. Inattention may manifest in social and academic settings. Hyperactivity symptoms include inability to sit still in classroom settings, fidgeting, being always "on the go," and talkative, while impulsivity make the child has difficulty in waiting turn role **(Eng et al., 2024).**

There is no exactly cause for ADHD known until now, but a combination of certain factors is considered to be responsible as genetic, organic, and environmental factors. Studies show that if parents have ADHD, children have more than a 50% chance of having ADHD and if pregnant women who drink alcohol or smoke, a child has more than a 30% chance of having ADHD **(Bukhari, 2022).**

There are three subtypes of ADHD, predominantly inattentive, predominantly hyperactive-impulsive and combined types. Symptoms of ADHD may be mistaken for disciplinary problems or missed entirely in well-behaved, quiet children, leading to a delay in diagnosis and treatment. Teachers play a vital role in identification of children with ADHD because children spend most of the daytime at schools contacting with their teachers and peers. So, teachers should have enough information about ADHD and its treatment **(Kristanto, 2023).**

Treatments of ADHD can improve children social and academic functioning and decrease the intensity of symptoms. Treatments include psychotherapy, play therapy, behavioral therapy, medication, education or training, or a combination of these methods of treatment. Although there is no cure for ADHD, it is very important to take medication to avoid serious consequences of ADHD **(Lucas, 2023).**

Teachers using a three-pronged strategy are successful in educating children with ADHD. First, Teachers identify the unique needs of the children. Second, Teachers select variant educational methods associated with behavioral interventions, academic instructions and classroom accommodations to meet children needs. Third, Teachers create a focus for ADHD children by doing several structures into daily practices as the presentation of new material in a step-by-step manner, the provision of short, clear instructions and the use of a regular timetable **(Currie et al., 2023).**

Health education program is a tool for providing knowledge and understanding for individuals in terms of health promotion. The aims of health education program for primary school teachers are providing information about importance of nutrition, exercise and physical activities and cleanliness for children, promoting mental and emotional health, helping children in understanding nature and purpose of health care services and facilities, taking precautionary measures against communicable diseases and improving teachers' knowledge, practice and attitude toward children with ADHD **(Kapur, 2020).**

Community and school health nurse has a unique position and an integral part in the process of increasing awareness for teachers and families of the affected children about ADHD. School nurses are considered the bridge connecting health and learning and provide care coordination for children with ADHD to optimize learning process. Collaboration and effective communication among school nurses, physicians, teachers and families help in providing children care, supporting and improving children social and academic condition **(Macyko, 2023).**

Significance of the Study

Attention deficit hyperactivity disorder affects 2.2% to 17.8% of all school-aged children worldwide. In Africa the prevalence was found to be 7.47% and was observed to be greater in boys than girls, with a male: female ratio of 2:1 **(Ayano et al., 2020).** In Arab countries, the prevalence is higher, reaching 9.4%–21.8% in Egypt, 11.6% in Saudi Arabia, and 6.24% in Jordan **(Azzam et al., 2021).**

Attention deficit hyperactivity disorder is a multifaceted disease characterized by the core symptoms of hyperactivity, inattention, and impulsivity, affecting children across every socioeconomic, ethnic, and regional group an estimated 40% to 60% of children with ADHD have comorbidities such as anxiety, depression, and learning disabilities. About 5% to 9% of ADHD children between the ages of 9 and 17 experience serious emotional and behavioral disturbances that may affect the ability to function at home, in school, or in the community **(Taylor et al., 2023).**

Attention deficit hyperactivity disorder can interfere with the child's education, mental health status, interpersonal relationships with others and cause psychiatric co-morbidity if children with ADHD are left untreated. Teachers involved in many aspects as referral of children with disturbed behaviors, social relations and general everyday functioning, provision

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information about academic history and performance, planning and implementation of treatment. Thus, lack of teachers' knowledge and/or negative attitudes towards children with ADHD result in improper management and treatment failure **(Young et al.,2020).**

Aim of this study

The present study amid to evaluate the effect of an educational program for teachers regarding attention deficit hyperactivity disorder among primary school children through the following objectives :

1 -Assess teachers' knowledge, attitude and reported practice regarding attention deficit hyperactivity disorder .

2 -Plan and implement the educational program for teachers regarding attention deficit hyperactivity disorder.

3 -Evaluate the effectiveness of educational program for teachers regarding attention deficit hyperactivity disorder.

Research Hypothesis

The teachers' knowledge, attitude and reported practice regarding attention deficit hyperactivity disorder will be improved after implementing the educational program about attention deficit hyperactivity disorder.

2. SUBJECT AND METHODS

Research Design:

A quasi-experimental study design was applied to achieve the aim of the current study.

Setting:

This study was conducted at nine primary schools were selected randomly in Beni Suef governorate (Elshrouk, Hassan Ismeal, Elsafowa, Elshaab, Elgazira Elhaddetha, Elnasr, Elsalam, and Elgalaa). The nine schools were located at Beni-Suef Governorate, the first three schools located at New Beni-Suef City, the second three schools located at Beni-suef City and the last three schools located at Beba City, each school included 25 teachers.

Sampling:

A multi-stage random sample technique was used for the selection of the teachers. **First stage:** Total number of centers at Beni-Suef governorate is seven centers, three centers were chosen randomly to conduct this study. **Second stage:** Three schools from each center were selected randomly. **Third stage:** All teachers in the selected schools were included in the study. The total number of teachers from schools were 225 teachers.

Tools for data collection:

Data for this study was collected by using the following tools**:**

1st tool: A structural interviewing questionnaire: Was designed based on literature review and approved by supervisors. It was written in simple Arabic language and consists of three parts:

Part I:

Sociodemographic characteristics of the teachers include age, gender, marital status, educational level, place of residence, years of experience and monthly income.

Part II:

Concerned with teachers' knowledge about attention deficit hyperactivity disorder include meaning, causes, risk factors, symptoms, diagnosis, complications, treatment and prevention of attention deficit hyperactivity disorder. This part was used before and after the educational program to evaluate the effect of the program.

Scoring System:

Teachers'knowledge was checked with a model key answer and accordingly. Teachers'knowledge was categorized into " complete correct answer was scored 2 grades, incomplete correct answer was scored with 1 grade and don't know was scored zero grade. Total scores were 20 grades for 10 items. These scores were stumped and converted to a percentage score.

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It was classified into 3 categories:

Good knowledge ≥ 75% (15- 20 grades)

Fair knowledge from 50% - < 75% (10 - < 15 grades)

Poor knowledge < 50% (< 10 grades)

Part III:

Concerned with teachers' reported practices related to attention deficit hyperactivity disorder. This part was used before and after the educational program to evaluate the effect of the program.

Scoring System

Teachers' reported practice regarding attention deficit hyperactivity disorder designed to be answered by done and not done. Scores of each item ranged from two to one (done = 2 and not done = 1). Total scores were 24 grades for 12 items. The scores of each item summed and converted to a percentage score. It was classified into 2 categories:

- **Adequate reported practices** ≥ 60 % (from 15 – 24 grades).
- **Inadequate reported practices** < 60 % (< 15 grades).

2nd tool:

Concerned with Teachers' attitude regarding attention deficit hyperactivity disorder. Adapted from (Greens et al., 1997). This scale was used before and after the educational program to evaluate the effect of the program.

Scoring system

Each item was evaluated as Likert scale of "Agree, Neutral and Disagree "3, 2, 1 respectively but in questions 2,5,9,12 are opposite scores "Agree, Neutral and Disagree" 1,2,3 respectively, total scores were 36 points for 12 items. The score of each item summed up and then converted to a percentage score.

It classified into 2 categories:

- **Positive attitude:** if score ≥ 60 % (22 – 36 grades).
- **Negative attitude:** if score < 60 % (< 22 grades).

Validity:

The validity of the tool was tested through a panel of three experts from Community Health Nursing Staff from Faculty of Nursing at Helwan University to review relevance of the tools for comprehensive, accuracy, understanding and applicability.

Reliability

Reliability of the study tools were tested for its internal consistency by Cronbach's Alpha. Cronbach's Alpha was 0.977 for knowledge, 0.939 for reported practices and 0.885 for attitude.

Ethical considerations:

Ethical consideration was gained from scientific ethical committee of Helwan University, teachers in the study were voluntary and given complete full information's about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, staining the possibility to withdraw at any time, confidentiality of the information was be guaranteed. Ethics, values, culture and beliefs were respected.

Preparatory phase:

A review of past and recent literature related to attention deficit hyperactivity disorder and methods of treatment. Covering all aspects helpful in designing and processing of data collection tools were available books, journals, internet and articles.

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Pilot study:

The pilot study has been conducted to test the clarity, applicability and understand ability of the tools. It has been conducted on a sample of 10% (23) of teachers. The results of the pilot helped in refining the interview questionnaire and to schedule the time framework. No modification was done so, the participants of the pilot were included in the main study sample.

Field work:

Before conducting the study, official permission was obtained from the directors of the schools. The researcher met the teachers and explained the aim of the study and components of the tools to them. Their informed verbal consent was secured before collecting data.

The researcher collected data for 2 days-week (Sunday and Tuesdays) visited the selected schools from 10 am-12 pm. Each session lasted about 25 - 30 minutes. The questionnaires were distributed and completed by the researcher from the studied teachers to assess their knowledge, reported practice and attitude at pre intervention phase.

The educational program was developed based on the result of pretest sheet. The plan of educational program was prepared, implemented and evaluate the degree of improvement in study group condition related to objective. The educational methods were used in the study include active group discussion, brain storming, demonstrating, redemonstrating and role play.

The researcher used supportive materials as papers, colored markers, laptop, power point, handout, pamphlet prepared by the researcher. By the end of each session the researcher told the teachers about the content and time of the next date of meeting. Data was collected during six months from October 2022 to April 2023. At the end of the educational program, the evaluation was done at post program phase by using the same tools at preprogram.

The educational program was conducted through four phases: preparatory, assessment, planning & implementation and evaluation.

- **Preparatory phase:** Tools of data collection development review of the past and current related literature covering various aspects of attention deficit hyperactivity disorder was done using available books, articles and magazine. The aim is acquainted with the research hypothesis to develop the study tools.

- **Assessment phase:** Before starting the designed educational program, the study tools was applied to assess teachers' knowledge, reported practices and attitude regarding attention deficit hyperactivity disorder.

- **Planning and implementing phase:** By developing the educational program content, the aim was to improve the teachers' knowledge, reported practice and attitude regarding attention deficit hyperactivity disorder, it was explained to all participants from teachers. Content of the program include meaning, causes, vulnerable group, risk factor, symptoms, diagnosis, complication, treatment and prevention of ADHD. The program tailored to suit teachers' needs, the researcher developed pamphlet which guided teachers about ADHD.

The studied teachers were divided into 9 groups, each group contained 25 teachers. The program was applied through nine sessions, each session took about 25 – 30 minutes. The program carried out in Beni-Suef primary schools.

At the beginning of the first session, the researcher welcomes and introduce self to teachers, an orientation to educational program was given, take oral informed consent of teachers, set an agreement on the time and duration of sessions. The researcher provides trust, warm and secure atmosphere between teachers group to relieve anxiety and increase motivation to participate in all sessions of the educational program. Teachers were oriented about program sessions (time, duration, place and content). Also, the researcher stressed on the importance of continuous attendance and active participation. The pretest questionnaire was given to them (pre-program test).

Different teaching and learning methods were used during the sessions, which include interactive lecture, group discussion, demonstration, redemonstration, instructional media included pictures and printed handout. Taking into consideration the use of simple and clear Arabic language that suit the level of teachers without ignoring motivation and reinforcement techniques to enhance learning. Inform the teachers that each session started by summary about the previous session and objectives of new session.

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The program was presented in a clear and concise form to be used as memorial reference. Direct reinforcement in the form of a copy from the booklet pamphlet was given as a reward for each teacher to use it as a future reference. Teachers were allowed to ask any interpretation or explanation of any item included in the sessions. At the end of every session, the teachers were discussed to correct any misunderstanding.

- **Evaluation Phase:** After implementation of the educational program, post-test was done at the nine session to evaluate the effect of the program on teachers' knowledge, reported practice and attitude. The post test was done immediately at the end of the sessions using the same tools of pretest evaluation.

III) Administrative Item

An official permission approval to conduct the study was obtained from the Dean of the Faculty of Nursing at Helwan university and official permission from the directors of selected schools in Beni Suef Governorate to obtain their approval to carry out this study. This letter included a permission to collect the necessary data and explain the purpose and nature of the study.

IV) Statistical analysis

Data collected from the studied sample was revised, coded and entered using personal computer (PC). Computerized data entry and Statistical analysis were fulfilled using the statistical Package for the Social Science (SPSS), version 25. Data were presented using descriptive statistics in the form of frequencies, percentage. Chi-squire test (X^2) was used for compressions between qualitative variables. Quantitative data was expressed as Mean ± SD (standard deviation). Pearson correlation coefficient used to calculate correlation between quantitative variables.

The significance level for all above mentioned statistical tests done. The threshold of significance is fixed at 5% level (p value).

Significance of the results:

- Highly significant at p-value < 0.01.
- Statistically significant was considered at p-value < 0.05.
- Non-significant at p-value > 0.05.

all information gathered would be kept confidentially and used only for the purpose of the study. Teacher also had right to withdraw from the study at any time, without giving any reasons.

3. RESULTS

Table (1): Frequency distribution of the studied teachers regarding their demographic characteristics (n=225).

Demographic characteristics	No.	%
Age		
20 - < 35 years	74	32.9
35 - < 45 years	76	33.8
45 - 60 years	75	33.3
Mean ± SD	39.72±10.40	
Gender		
Male	22	9.8
Female	203	90.2
Marital status		
Single	63	28.0
Married	162	72.0
Years of experience		
5 - < 15 years	102	45.4

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15 - < 25 years	93	41.3
≥ 25 years	30	13.3
Monthly income		
Sufficient	92	40.9
Insufficient	130	57.8
Sufficient and save	3	1.3

Table (1): Reveals that, 33.8% of the studied teachers aged from 35 - < 45 with Mean ± SD 39.72±10.40, 90.2% of them were female while 72% of them were married, 45.4% of them had years of experience from 5 - < 15 years and 57.8% of them had insufficient monthly income.

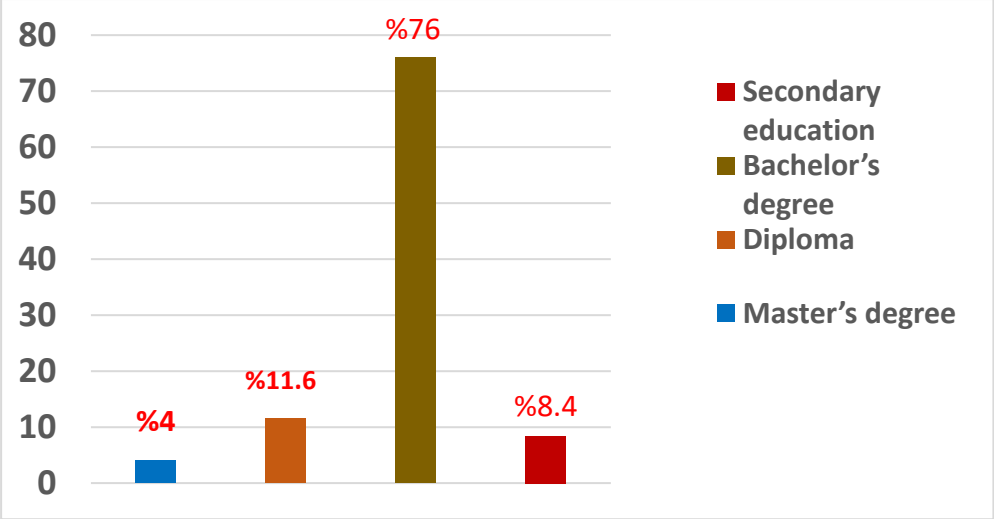

Figure (1): Percentage distribution of the studied teachers' level of education (n= 225).

Figure (1): Illustrates that, 76% of the studied teachers had bachelor's degree, 11.6% of them had diploma and 8.4% of them had secondary education while 4% of them had master's degree.

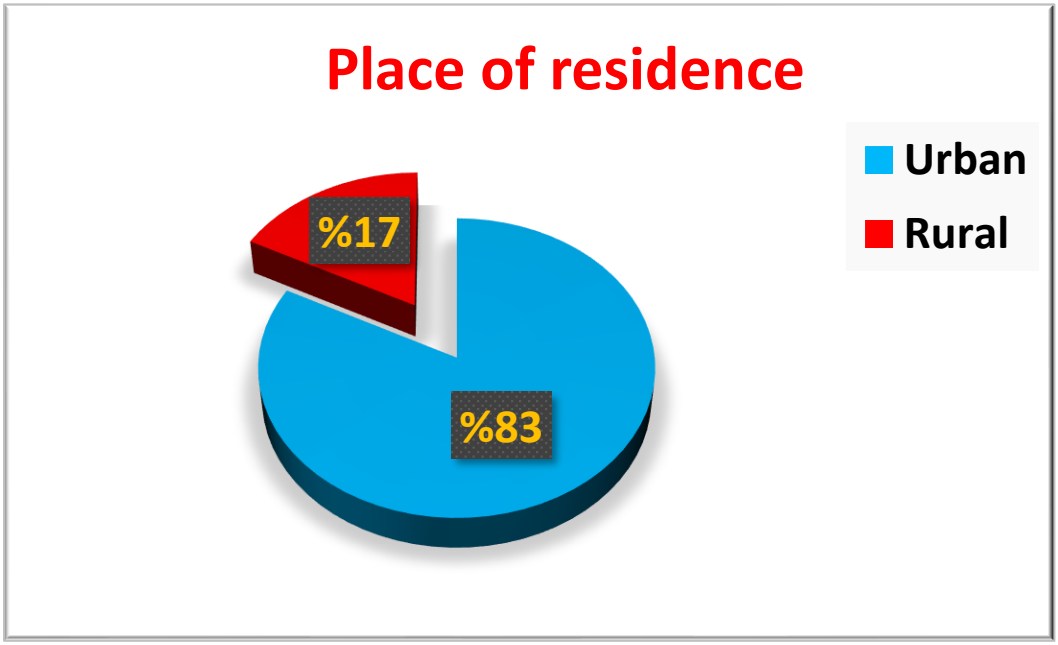

Figure (2): Percentage distribution of the studied teachers according to place of residence (n=225).

Figure (2): Illustrates that, 83% of the studied teachers live in urban area while 17% of them live in rural area.

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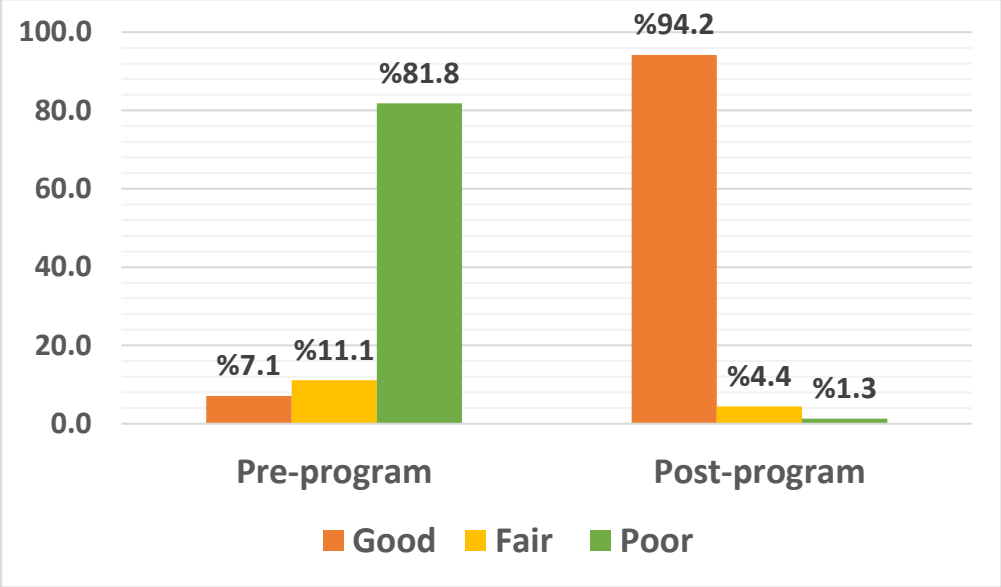

Figure (3): Percentage distribution of the studied teachers according to their total knowledge level about attention deficit hyperactivity disorder at pre & post program (n=225).

Figure (3): Shows that, 81.8%, 11.1% and 7.1% of the studied teachers had poor, fair and good knowledge level about attention deficit hyperactivity disorder respectively at preprogram, which improved to 94.2%, 4.4% and 1.3% of studied teachers had good, fair and poor knowledge level respectively at post program with P value =0.000.

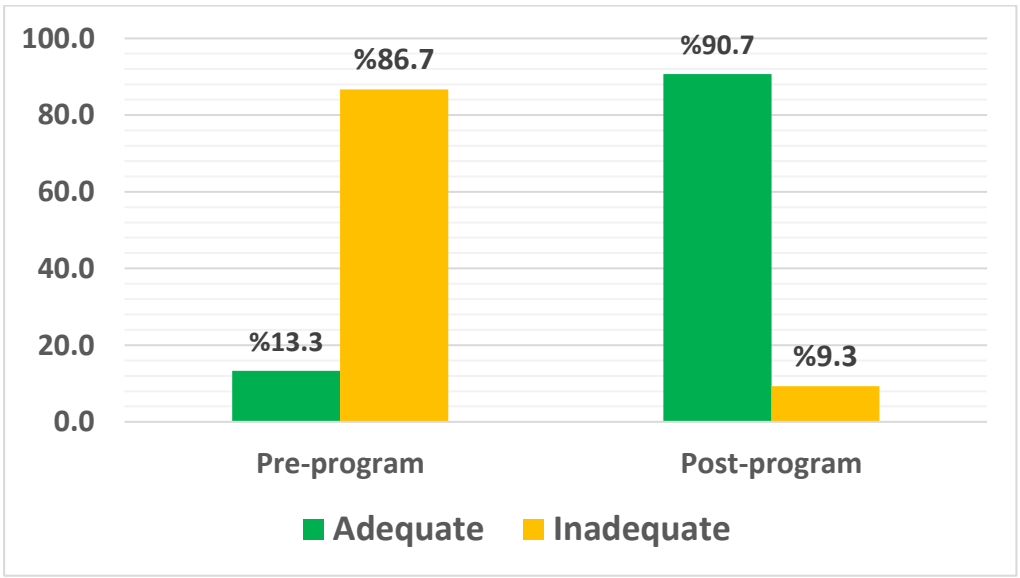

Figure (4): Percentage distribution of the studied teachers according to total reported practices level regarding attention deficit hyperactivity disorder at pre and post program (n=225).

Figure (4): Shows that, 86.7% and 13.3% of the studied teachers had inadequate and adequate reported practices level regarding attention deficit hyperactivity disorder respectively at preprogram, which improved to 90.7% and 9.3% of studied teachers had adequate and inadequate reported practices level regarding attention deficit hyperactivity disorder respectively at post program.

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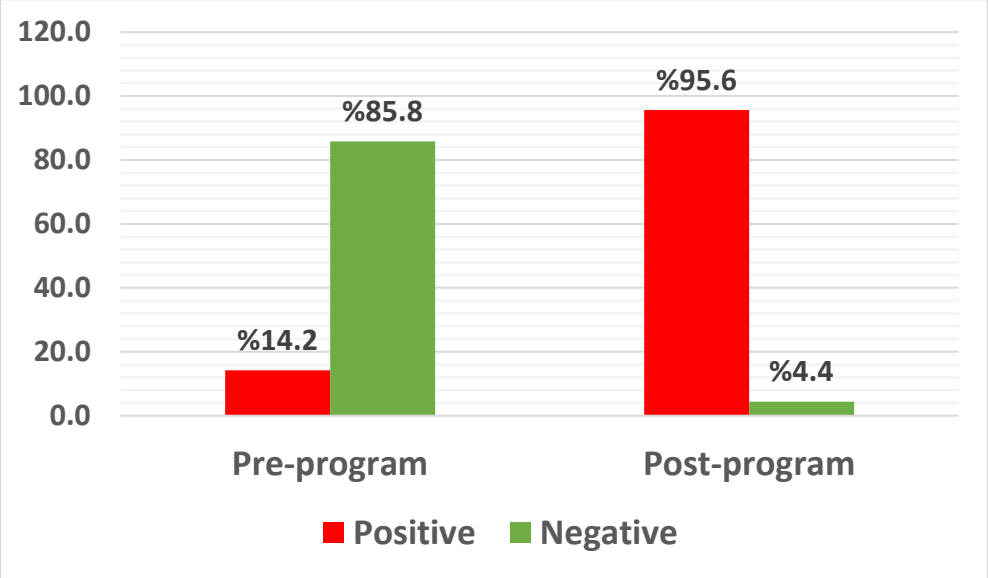

Figure (5): Percentage distribution of the studied teachers according to their total attitude level regarding attention deficit hyperactivity disorder at pre and post program (n=225).

Figure (5): Illustrates that, 85.8% and 14.2% of the studied teachers had negative and positive attitude toward students with attention deficit hyperactivity disorder respectively at preprogram, which improved to 95.6% and 4.4% of them had positive and negative attitude toward students with attention deficit hyperactivity disorder respectively at post program.

Table (2): Correlation between Knowledge, reported practices and attitude of the studied teachers at post program (n=225).

Variables	Post-program					
	Total knowledge		Total reported practices		Total attitude	
	R	P	r	P	r	P
Total knowledge level	-	-	0.217	0.001**	0.401	0.000**
Total reported practices level	0.217	0.001**	-	-	0.191	0.027*
Total attitude level	0.401	0.000**	0.191	0.027*	-	-

r Pearson Correlation Coefficient test

* Statistically significant at $p \leq 0.05$.

** Highly statistically significant at $p \leq 0.01$

Table (2): Shows that, there is highly statistically significant positive correlation between total knowledge, reported practices and attitude at ($P \leq 0.01$) at post program. Also shows that there is statistically significant positive correlation between total reported practices level and total attitude level at post program ($P \leq 0.05$).

4. DISCUSSION

Attention deficit hyperactivity disorder is a childhood psychiatric disorder characterized by developmentally inappropriate and pervasive levels of hyperactivity, inattention and impulsivity. The core symptoms of ADHD may affect a child's functioning in an educational environment and the diagnosis of ADHD is associated with poor school outcomes including poorer reading ability, writing and mathematics, lower school grades and exclusion from school. Symptoms of ADHD appear at an early stage of age and may be more noticeable when children environment change, as when they start school **(Drechsler et al., 2020).**

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Teachers spend a great time dealing with children at school and frequently observe how children behave in various educational settings. So, teachers anticipate being the first to notice and identify symptoms of ADHD in children. About 11% of school age children are believed to have ADHD. This disorder poses serious issues for children, teachers, family members and siblings **(Dort et al., 2022).**

Health education program for teachers regarding attention deficit hyperactivity disorder among primary school children aimed to improve teachers' knowledge, practices and attitude toward children with ADHD. This program provides teachers with necessary knowledge about ADHD and skills to deal with ADHD children to support the learning process and help children to acquire academic and social skills necessary to manage their life **(Sedky et al., 2022).**

Demographic characteristics for the studied teachers

the present study findings showed that, more than one third of the studied teachers' age group ranged between 35 - < 45 years with the mean age was 39.72 ± 10.40 year. This result was congruent with the study performed by **Alzahrani et al., (2023)** in Saudi Arabia (n= 359) entitled as "*Primary School Teachers' Attitude and Knowledge regarding Attention Deficit Hyperactivity Disorder among Students*" and reported that 38.7% of the teachers' age ranged from 35 - < 45 years. Also, this finding approved with the study performed by **Aljohani, (2018)** in Saudi Arabia (n=416) entitled with " *Elementary school teachers' knowledge of attention deficit/hyperactivity disorder"* and reported that the mean age of the studied teachers was 39.9 ± 6.2. In addition, agreed with the study performed by **Safaan et al., (2018)** in Egypt (n= 500) entitled as *"Teachers' Knowledge about Attention Deficit Hyperactivity Disorder among Primary School Children"* and reported that the mean age of the participants was 39.14 ± 7.88 years. From the researcher point of view, this result might be due to there are no new recruitments of newly graduated teachers.

Regarding to gender, the present study showed that, most of the studied teachers were female. This result was consistent with result of **Padilla et al., (2018)** in Colombia (n=62) entitled as "*Knowledge of ADHD among primary school teachers in public schools in Sabaneta, Antioquia, Colombia*" and reported that 94.8%of the studied teachers were female. Also, this finding was congruent with the study performed by **Hussain et al., (2023)** in Karbala (n=85) entitled as *"Teachers' Knowledge about Attention Deficient Hyperactivity Disorder (ADHD) among Student at Primary School in Karbala City"* and reported that the majority of the studied teachers were female. In addition, agreed with the study done in New York City by **Capizzi, (2018)** (n=179) entitled with "*ADHD and the Elementary School Teacher: Personal Experience and Professional Knowledge, Self-Efficacy, and Attitude toward Students Diagnosed With ADHD*" who stated that most of the studied teachers were female.

Regarding to marital status, the present study showed that, less than three quarters of the studied teachers were married. This finding was in the same line with the study performed by **Mohammed et al., (2023)** in Nigeria (n=200) entitled as " *Effectiveness of a training programme on the knowledge and perception of Attention-Deficit Hyperactivity Disorder among primary school teachers in Kano, Nigeria* " and reported that 71.1% of the studied teachers were married. Also, this finding approved with the study performed by **Amha & Azale, (2022)** in Ethiopia (n=417) entitled as "*Attitudes of primary school teachers and its associated factors toward students with attention deficit hyperactivity disorder in Debre Markos and Dejen towns, Northwest Ethiopia* " and reported that 72.9% of the studied teachers were married. Conversely, this finding was disagreed with the study done in Sharjah performed by **Saad et al., (2022)** (n=264) entitled with **"***Knowledge about attention-deficit/ hyperactivity disorder among primary schoolteachers in Sharjah, UAE*" and reported that the majority of the studied teachers were married.

Regarding to level of education, the present study showed that, more than three quarters of the studied teachers had bachelor's degree. This finding was in agreement with the study performed by **Aldawodi et al., (2019)** in Saudi Arabia (n=141) entitled with *"Knowledge and Attitude of Male Primary School Teachers about Attention Deficit and Hyperactivity Disorder in Riyadh, Saudi Arabia*" and reported that 79 % of the studied teachers had bachelor's degree. Also, this finding was congruent with **Basudan et al., (2019) (n=376)** who studied "*Knowledge and Attitude of Female Teachers toward ADHD at Elementary Schools, Jeddah, KSA*" and reported that the majority of teachers had bachelor's degree. In addition, agreed with the study done in Sudan by **Omer et al., (2023)** (n=59) entitled as *"Primary School Teachers' Perspectives on ADHD in Alkadrow, Khartoum, Sudan"* and reported that 78% of the studied teachers had bachelor's degree. On the other side, this finding disagreed with the study done in Iran (n=120) by **Hosseinnia et al., (2020)** entitled as "*Knowledge, attitude,*

and behavior of elementary teachers regarding attention deficit hyperactivity disorder" and reported that 52% of the studied teachers' level of education was bachelor' degree.

Regarding to years of experience, the present study showed that more than two fifths of the studied teachers had years of experience between 5 -<15 years. This finding was in the same line with the study performed by **Lamichhane & Sharma, (2019)** in Chitwan (n=328) entitled with *" Knowledge on Children's Attention Deficit Hyperactivity Disorder among School Teachers in Chitwan*" and reported that 46 % of the studied teachers had teaching experience between 5 - < 15years. on the other hand, this result was in disagreement with the study done in Texas by **Hamilton, (2021) (**n=11**)** entitled as **"***The Impact of Teacher Training on ADHD: Assessing Classroom Interventions and Teacher's Self-Efficacy"* and reported that 78.4% of the studied teachers had years of experience between 1 - < 10.

Regarding to residence, the present study showed that more than four fifths of the studied teachers live in urban areas. This finding was congruent with the study performed by **El Hawy et al., (2023)** in Egypt (n=72) entitled with *"The Effect of Educational Intervention on Teachers' Knowledge of Attention-Deficit Hyperactivity Disorder"* and reported that 81.8% of the studied teachers live in semiurban and urban areas. Conversely, this result was in disagreement with the study done in Pakistan by **Faizan et al., (2021)** (n=600) entitled with "*knowledge, attitudes, and practices of primary school teachers towards ADHD students*" who stated that the majority of the studied teachers live in rural areas. Also, this result disagreed with the study done in Iraq by **Hamed & Ghafel, (2022) (**n=354**)** entitled as "*Evaluation of Elementary School Teachers' Knowledge about Attention Deficit Hyperactivity Disorder (ADHD)*" and reported that only 37.8% of the studied teachers live in urban areas.

Regarding to monthly income, the present study illustrated that more than half of the studied teachers had insufficient monthly income. This result was consistent with the study done in India by **Kaur et al., (2020)** (n=60) entitled with *"Effectiveness of structured teaching programme regarding attention deficit hyperactivity disorder in children among teachers of selected primary schools in district Sri Muktsar sahib, Punjab"* and reported that, more than half of the subjects had insufficient monthly income. This result might be due to the high standard of living and high prices of products which make the income not sufficient.

Regarding to total knowledge about attention deficit hyperactivity disorder, the present study showed that, more than four fifths of the studied teachers had poor knowledge about ADHD pre-program, which improved to the most of them had good knowledge post-program with p value = 0.000. This result was in accordance with the study done in India by **Tyagi et al., (2022)** (n=60) entitled with **"***Effectiveness of Video-Assisted Teaching on Knowledge and Attitude Regarding Attention Deficit Hyperactivity Disorder among Primary School Teachers in Gurugram, Haryana, India: A Pre-Experimental Study***"** and reported that in pre-test, mostly teachers had inadequate knowledge and in post-test the majority of teachers had adequate knowledge. From the researcher point of view this result may be because of effectiveness of educational program about ADHD in improving teachers' knowledge about ADHD.

Concerning to total reported practices regarding attention deficit hyperactivity disorder, the present study showed that, less than one fifth of the studied teachers had adequate total reported practices level at pre implementation of educational program, which improved to the most of them had adequate total reported practices level at post implementation of the educational program with p value = 0.000. This result in accordance with the study done in Iran by **Mazaheri & Heidari, (2020)** (n=58) entitled *with " Educational Intervention for Increasing Teachers' ADHD Knowledge, Attitude, and Behavior"* and reported that the studied teachers' performance improved after the implementation of educational program. From the researcher point of view this result may be due to effectiveness of educational program in improving teachers' practices.

Concerning to total attitude level regarding attention deficit hyperactivity disorder, the present study reported that, the majority of the studied teachers had negative attitude toward children with attention deficit hyperactivity disorder at pre implementation of an educational program, which improved to most of them had positive attitude toward children with ADHD at post implementation of the educational program. This result was congruent with the study done by **Tyagi et al., (2022)** who reported that the majority of the studied teachers had positive attitude toward children with ADHD after the implementation of educational program. Also, this result in the same line with the study performed by **Mazaheri & Heidari, (2020)** and reported that the studied teachers' attitude improved after the implementation of education program. On the

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other side, this result disagreed with the study done by **Hamilton, (2021)** who reported that there were no significance differences between pre and post implementation of educational program in teachers' attitude. From the researcher point of view this result may be due to the success of the educational program in changing the studied teachers' attitude toward children with ADHD.

According to correlation between the studied teachers' knowledge and their reported practices regarding attention deficit hyperactivity disorder at post implementation of the education program, the current study reported that, there was highly statistically significant positive correlation between total knowledge level among the studied teachers and their reported practices regarding attention deficit hyperactivity disorder at p value ≤ 0.01. This result was congruent with the study done in Saudi Arabia by **Alabd et al., (2018)** (n = 95) entitled with "*Effect of Educational program on Elementary School Teachers' Knowledge, Attitude and Classroom Management Techniques regards Attention Deficit Hyperactivity Disorder*" and reported that there was statistically significant positive correlation between total knowledge level among the studied teachers and their reported practices regarding children with ADHD. From the researcher point of view this result may be due to good knowledge is very important to do better and correct practices.

Regarding to correlation between the studied teachers' knowledge and their attitude regarding attention deficit hyperactivity disorder at post implementation of the education program, the present study showed that, there was highly statistically significant positive correlation between total knowledge level among the studied teachers and their attitude regarding attention deficit hyperactivity disorder at p value ≤ 0.01. This result was in accordance with the study done in India by **Bhasin et al., (2020)** (n = 100) entitled as " *Effect of Video based Teaching on Knowledge and Attitude regarding ADHD of Children among Primary School Teachers*" who revealed that highly statistically significant positive correlation between total knowledge level among the studied teachers and their attitude toward children with ADHD. Also, this result in the same direction with the study done in Iran by **Derakhshanpour et al., (2021)** (n = 144) entitled as "Effectiveness of Educating Program on Knowledge, Attitude, and Performance of Primary School Teachers Toward Attention-Deficit/Hyperactivity Disorder" and revealed that highly statistically significant positive correlation between total knowledge level among the studied teachers and their attitude toward children with ADHD. From the researcher point of view this result may be due to good knowledge is very important to know how to deal with students in positive manner.

Related to correlation between the studied teachers' attitude and their reported practices regarding attention deficit hyperactivity disorder at post implementation of the education program, the current study showed that, there was statistically significant positive correlation between total attitude level among the studied teachers and their reported practices regarding attention deficit hyperactivity disorder at p value ≤ 0.05. This result was in agreement with the study done in Saudi Arabia by **Khalil et al., (2019)** (n = 57) entitled with "Knowledge, Attitude, and Behavioural Practice of Elementary Teacher of ADHD Children: Impact of an Educational Intervention" and revealed that there was statistically significant positive correlation between total attitude level among the studied teachers and their reported practices toward children with ADHD. From the researcher point of view this result may be due to positive attitude always leads to good practices.

5. CONCLUSION

On the light of results of the current study and research hypothesis, it could be concluded that; there was more than four fifths of the studied teachers had poor knowledge about ADHD pre-program, which improved to the most of them had good knowledge post-program. Concern to teachers' reported practice, less than one fifth of the studied teachers had adequate reported practices level at pre implementation of educational program, which improved to the most of them had adequate reported practices level at post implementation of the educational program. As regard teachers' attitude, the majority of the studied teachers had negative attitude toward children with attention deficit hyperactivity disorder at pre implementation of an educational program, which improved to most of them had positive attitude toward children with ADHD at post implementation of the educational program. Moreover, there was highly statistically significant positive correlation between total knowledge level among the studied teachers, their reported practices and their attitude regarding attention deficit hyperactivity disorder at p value ≤ 0.01. Also, there was statistically significant positive correlation between total practices level and total attitude level at post program (P ≤ 0.05).

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6. RECOMMENDATIONS

On the light of the current study findings the following recommendations are suggested:

- Continuous implementing of the educational programs and workshops for teachers about attention deficit hyperactivity disorder.
- Dissemination of booklet and posters about attention deficit hyperactivity disorder and its consequences for teachers and families.
- Enhance teachers, parents, and community awareness about attention deficit hyperactivity disorder through mass media.
- Incorporating ADHD training programs into teachers training curricula with regular reinforcement through in-service training.
- Further research on a large sample and another setting is needed.

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