

Impact of Intervention Program on Attention of Attention Deficit Hyperactivity Children (ADHD)

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ABSTRACT

Background: Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a repeated pattern of symptoms that can be recognized in childhood; it presents as inattention and/or hyperactivity-impulsivity.

Aim: To investigate the impact of an intervention program on attention of attention deficit hyperactivity disorder.

Methods: A randomized controlled trial (RCT) was utilized in this study. **Sample:** A purposive sample consisted of 50 children who were diagnosed as having ADHD. The study was conducted at the child psychiatric outpatient clinic at the Center of Social and Preventive Medicine, located at AbooElrish children hospital / Japanese Hospital; Faculty of Medicine, Cairo University. There were two tools for data collection: Demographic data sheet and Conners' Parenting Rating Scale.

Results: The study showed that there was a highly significant difference between Conners' Parenting Rating Scale results for the study group before and after implementing the program than the control group.

Conclusion: the study concluded that, the structured intervention program improved a significant on improving the cognitive adaptation of children with ADHD.

Keywords: ADHD, intervention program, child

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a repeated pattern of symptoms that can be recognized in childhood; it presents as inattention and/or hyperactivity-impulsivity (American Psychiatric Association, 2013)¹.

The most recent Diagnostic and Statistical Manual of Mental Disorders (DSM-5)² has revised the diagnostic criteria for ADHD. To be diagnosed with ADHD, a child or younger adolescent needs meet six out of nine possible inattentive symptoms (such as failing to give close attention to details or being easily distracted) and/or six out of nine possible hyperactivity/impulsivity symptoms (such as being "on the go" or difficulty waiting their turn). Also, symptoms need to be present for at least 6 months, occur in at least two different settings, be present before 12 years of age, and not be better explained by another disorder. For older adolescents and adults, the number of required symptoms per category is reduced to five out of nine. ADHD has three presentations: 1) predominantly inattentive, 2) predominantly hyperactive/impulsive, and 3) combined, based on how many symptoms in each diagnostic category an individual meets. ADHD that does not clearly fall into these categories can be referred to as ADHD-Not Otherwise Specified (Duke Evidence-based Practice Center, Durham, 2018)³.

Children with ADHD exhibit high rates of aggressive behaviors and rule-breaking, relative to typically developing peers. In turn, aggression and rule-breaking contribute to peer rejection and social impairment (Nora Bunford, Steven, Evans, and Joshua 2018)⁴. Studies suggest that children with ADHD have poor cognitive functioning on verbal comprehension, perceptual reasoning, working memory and processing speed as compared to normal

children. The primary deficit in attention manifests as difficulties in planning; failing to sustain on tasks, often causing difficulties and deterioration in academics for school going children with ADHD (Kotnala, Halder, 2015)⁵.

ADHD and family, The families of children with ADHD have to contend with a greater number of behavioral, developmental and educational disturbances. This often requires that more time, logistics and energy be spent. It is not surprising that these increased demands are frequently associated with more stress in marital and family functioning. Disruption for siblings also arose due to expectations that they act as caretakers for their brother or sister with ADHD. Older and younger siblings reported that their parents expected them to play with and supervise the child with ADHD (Cunningham, 2007)⁶.

School nurses must be an integral part of the process of increasing awareness about ADHD through improving the service delivery model for affected children and their families (Alazzam, Suliman, AlBashtawy, 2016)⁷.

Understanding psychiatric nursing presents a particular challenge. In most other nursing specialties there is an emphasis on physical care that requires technical skills that can be quantitatively measured. Mental health problems require patterns of care which focus on psychological, spiritual and social well being as well as the physical aspects of the person. The delivery of these other aspects of care requires a level of interpersonal skills that is difficult to quantify and therefore difficult to describe (Seamus Cowman Mary Farrelly Patricia Gilheaney, 2019)⁸.

Significance of the Study: Children who have ADHD with hyperactivity are usually recognized and diagnosed in preschool or early elementary school grades, especially if they are disruptive and difficult to manage. Most individuals with ADHD, predominantly inattentive type are not

recognized until later when parents or teachers notice that they are having a lot of difficulty staying focused on tasks, or remembering what they have read, or in keeping up with their work in school, homework or tasks at home.

According to the definition of ADHD in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV), the prevalence in 22 Arab countries was 1.3–16%. In 2 studies in Egypt, prevalence ranged from 6.5% among primary school children in grades 3–5 aged 8–10 years to 7.5% among children aged 4–12 years. The prevalence of ADHD based on DSM-V among children aged 6–14 years in Fayoum City, Egypt reached 20.5%. In western countries, the prevalence ranged from 7.3% in Italy to 10.6% in France and the United States of America (Aboul-ata, Amin, 2018)(9).

According to the statistical documentation of the researches that has been carried out in Assiut governorate revealed that the prevalence rate of ADHD was 6% among elementary schools, male to female ratio was 1.5:1 (Wageeh & Hassan, 2005)¹⁰. EL-Minia governorate the study revealed that the prevalence of ADHD was 6.5%, Male to female prevalence ratio was 1.61:1 (soliman, 2010)¹¹. Also, the prevalence of ADHD among basic school children in Menoufia governorate was 6.9% (6.8% in urban and 6.9% in rural). There was a higher prevalence of ADHD in male than female children with male to female ratio of nearly 3.5:1 (Alkot, 2014)¹². In Alexandria, Egypt 7.48% (Attia, 2000)¹³.

While ADHD diagnosed children can have either inattention or hyperactive features or a combination of both; prevalence studies report relatively higher rate of inattention type (5.1%) compared to hyperactive type (2.9%) in children 6-12 years old, and 5.7% against 1.1% in children 13-18 years old (Willcutt EG, 2012)¹⁴.

Therefore it was planned to construct intervention program to overcome the Attention Deficit Hyperactivity Disorder negative consequences for children's education at school, which might restrict carrying out activities and that add limitations to their academic performance, which are presented in a form of problems with sequencing complex movements, reading and, writing limitation and calculation skills, trouble with carrying out general tasks, self-care deficit interpersonal interactions and relationships with others. further to activate the role of school mental health nurse.

This study aimed to examine the impact of the intervention program on the child's attention who diagnosed as ADHD.

Research hypothesis: A child's attention will be improved for the child who attend and participate throughout the intervention program more than the children who did not attend.

Operational definitions: **ADHD:** is a neurodevelopmental disorder, repeated pattern of symptoms that can be recognized in childhood; it presents as inattention and/or hyperactivity-impulsivity (Conners Parenting Rating Scales (CPRS) 2008).

Intervention program: A constructed intervention program developed by the researcher focused on the span of attention of the inattentive child with ADHD. By participating in specific planned, organized and time table activities or homework for achieving certain objectives. The

total number of sessions was 12 the duration of each range from 30 to 45 min. The member of each session consisted of five children with their parents in addition to the researcher, all children and their parents divided into five groups, each of which attend one session per week.

Child: who aged 7-12 years old, both genders, recently diagnosed as ADHD

METHODOLOGY

Research Design: A randomized controlled trial (RCT)

Sample: A purposive sample consisted of (50) according to the sample size equation was calculated using a G-power version 3.1.1 for power analysis. A Power of .95 ($\beta=1-.95=.05$) At alpha. 5(one-sided) was used as the significance level and effect size=(.03). It was divided into two groups control and study group each group consists of 25 participants. Selected and randomly allocated with concealment of randomization until allocation occurs for two groups. The groups randomly allocated through using toss. In which the 50 codes of children concealed in a slip of paper and mix thoroughly, then 25 were selected to represent the study group (group 1) intervention program, control group (group 2) medication (routine).

Setting: The study was conducted at the child psychiatric outpatient clinic at the Center of Social and Preventive Medicine, located at Abo Elrish children hospital / Japanese Hospital; Faculty of Medicine, Cairo University.

Data Collection Tools: There were two tools for data collection:

A. The demographic data sheet was developed by the researcher to record all the related demographic data of the sample, i.e., age, place of residence, parent's educational level, IQ,....

B. Conners' Parent Rating Scales (CPRS): Conners' test (C. Keith Conners, 2008) parent form shows typical ADHD behaviors (standard tool) Conners CPRS parent form contains a series of questions about the child. The short version is often used as initial evaluations when ADHD is suspected. It contains seven areas (conduct disorder, behavior, anxiety, 10 item hyperactivity index, impulsive hyperactivity, learning problems, and psychosomatic). Reliability and validity were tested (i.e. 0.52 to 0.94) (MHS, 2016)(15)

Ethical consideration: A written ethical approval was received from the Ethics of Scientific Research Committee of the faculty of nursing - Cairo University. The informed consent was obtained from the participants (parents) after complete description of the purpose and nature of the study. All subjects had been informed that participation in the current study is voluntary, anonymity and confidentiality of each subject were protected by the allocation of a code number for each participant. They were informed that they can be withdrawn from the research at any time without any risk or punishment.

Procedure: The following research was conducted according to the following:

Pre-assessment phase (September 2019): children who diagnosed as ADHD child during this month they were about 100 children, then selected 50 children who were fit with the inclusion criteria. They were divided into two groups control and study group each group consists of 25

participants. Then they were selected and randomly allocated with concealment of randomization.

Assessment phase: The sample both study and control group were filled the needed tools as: (Demographic data sheet, Connor's Parent Rating Scale (pretest))

Implementation Phase (October – February 2020): the participants and their parents were informed about the content of the program, activities for training, and number of sessions. The program was implemented on 12 sessions classified as one session per week for 30-45 minutes. The parents also were shared on the program through the homework and health teaching after each session from the 6th to 12th session, after the child sharing at the first six session's activities and observe the child behavior by the researcher. Then, parents attend health teaching session for teaching and stress reliving (what is the ADHD, symptoms, method of treatment, how to deal with ADHD children, ways of punishment and reward, the impact of the parental relationship with the child).

The intervention program sessions as following:
Session (1): Introduction and Overview of the program,
Session (2): (melting snow) through physical skill, and a fun way to begin acquaintance,
Session (3): Sit without fidgeting in the chair for 4 minutes,
Session (4): Stimulate the child's ability to remember (story events),
Session (5): continuing stimulate the child's ability to remember (through coloration),
Session (6): Doing sport movements,
Session (7): Attention to what is required of the duty and its implementation.,
Session (8): Enhancing the power of observation in the child and Playing in a group,
Session (9): Enhancing children's attention,
Session (10): Harmony with children and deal gently with everything around him (human, animal, inanimate), also inform the participant for the ending time of the program,

Session (11): The ability to identify similarities and differences in pictures, and development The child's ability of observation and Session (12): Conclusion and summary. The teaching methods were used through the program

sessions, role play, group discussion, cognitive exercises, and feedback. The evaluation methods were used through the program session questionnaires, feedback, and re-demonstration.

Evaluation Phase: After application of the program in the study group who was attending the program, they once again completed Conners' Parenting Rating Scale at the posttest phase in order to evaluate the effect of the program on their child's attention.

Statistical design: A Statistical Package for Social Science (SPSS) version 20 is used for statistical analysis of data, Parametric inferential statistics as descriptive (mean & SD), t-test, (ANOVA) and regression analysis were used to examine the differences and similarities between study variable as well as analysis of variance to examine found correlations. Probability (p-value) less than 0.05 was considered significant and less than 0.001 considered as highly significant.

RESULTS

Personal characteristics of study group & control group

Table 1 illustrated that The highest percentage of the study sample was 64% (from 7 to 8 years), while it was 52% of the control group. The lowest percentage of the study sample was 12% (from 11 to 12 years), while it was 8.0% of the control group. It also revealed that the majority of the both study and control group was male children.

Table 2 explained the significant relation between Conner's parent rating scale of the study group post the program among impulsive, hyperactive symptoms (p-value = 0.002, 0.001).

Table 4 revealed that, there was a significant relation between Conner's parent rating scale of the study group (p-value = 0.0001, 0.084) and the control (p-value = 0.017, 0.037) post the program regarding learning problems.

Table 1: Frequency Distribution of the sample (n=25 for each group) according to age and gender

Demographic data	Study group		Control group		Chi-square	P-value
	n	%age	n	Percent		
Age						
7-8	16	64.0	13	52.0	3.02	0.22
9-10	6	24.0	10	40.0		
11-12	3	12.0	2	8.0		
Gender						
Male	19	76.0	19	76.0	0.00	1.00
Female	6	24.0	6	24.0		

Table 2: Comparison between Conner's parent rating scale of the study group and control pre and post program regarding impulsive, hyperactive (n = 25 for each group).

Items	Study group				T- test	P- value	Control group				T-test	P- value
	Pre program		Post program				Pre program		Post program			
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
Excitable, impulsive	2.16	0.90	1.64	0.91	2.031	0.053	2.36	0.95	2.04	0.93	1.204	0.241
Wants to run things	2.28	0.98	1.84	0.90	1.653	0.111	1.92	0.86	1.56	0.77	1.559	0.132
Restless in the “squirmy” sense.	2.40	0.76	1.64	0.76	3.536	0.002*	2.56	0.82	2.40	0.91	0.653	0.520
Restless, always up and on the go	2.44	1.00	1.48	0.82	3.712	0.001*	2.48	0.59	2.16	0.55	1.984	0.059

*significant

Table 3: Comparison between Conner's parent rating scale of the study group and control pre and post program regarding learning problems (n = 25 for each group).

Items	Study group				T- test	P- value	Control group				T- test	P- value
	Pre program		Post program				Pre program		Post program			
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
Difficulty in learning.	2.16	1.11	1.68	0.99	1.61	0.120	2.16	0.99	1.92	1.04	0.84	0.412
Fails to finish things.	2.08	1.04	1.56	1.00	1.80	0.084*	2.16	0.69	1.68	0.63	2.57	0.017*
Distractibility or attention span a problem	2.64	0.76	1.76	0.72	4.20	0.0001*	2.52	0.71	2.08	0.70	2.21	0.037*
Easily frustrated in efforts.	1.80	1.12	1.24	0.83	2.01	0.056	1.44	1.08	1.64	1.04	0.67	0.511

*significant

DISCUSSION

Regarding the demographic characteristics of the child, the findings of this study indicate that the child age ranges from 7 to 12 years. The result was in agreement with Diagnostic and Statistical Manual of Mental Disorders (5th Edition) 2013 which highlighted that about 2-5% (around 1 in 30) students at school suffered from ADHD symptoms. Also, National Institute for Health and Care Excellence, (2018)¹⁶ highlighted that The 'core symptoms' of attention deficit hyperactivity are usually present before the student is 12 years of age and can persist throughout their school life. Barbara T. Felt, et al, 2014¹⁷, Reported that Behavioral treatments are recommended for preschool-aged children and may be helpful at older ages. Also, Adler A, Spencer J, Wilens E, 2015¹⁸ mentioned that the average age of ADHD diagnosis is 7 years old, Whereas, symptoms of ADHD first noticed at an early age and most children are diagnosed between 6-12 years of their age.

The study also clarifies that about the two thirds of the ADHD children are boys, while the one third of the sample is girls. It might be because of the biological make-up of the female does not give obvious problematic consequences as a male. The findings are in agreement with Alkot (2014)¹² who indicated that the prevalence of ADHD among basic school children in Menoufia governorate was 6.9%. There is a higher prevalence of ADHD in male than female children with a male to female ratio of nearly 3.5:1.

Also, this result matches Jane Collingwood (2015)¹⁹ who confirmed that the lower diagnosis rate among females in childhood could be because of girls with ADHD are more likely than boys to have the inattentive form of ADHD, and less likely to show obvious problems. The researcher also asserted that the externalizing disorders are more common in males than females.

This study clarified that there was a significant relation between conduct disorder, impulsive hyperactivity and behavior and Conners' scale, by which the impact of the physical activities in the program on the child's hyperactivity, impulsivity, 10 index behavior is positive this result matched with Dishman et al., (2006)²⁰ which emphasized that Some researchers argue that voluntary physical activity can positively alter brain plasticity by Neurogenerative, Neuroadaptive, and Neuroprotective processes. Also, Claudia Verret et al., (2012)²¹ clarified that participation in a physical activity program improves muscular capacities, motor skills, behavior reports from parents and teachers, and level of information processing.

According to the study group in this study by performing regular and fixed physical activities within the group of children and listening to music which had a great impact on the study group. They became more active,

concentrate, cheerful, and their parents reported that they were interested in the physical activities. When the parents used this physical activity at home, They reported that their children become better than they were.

The findings of this study clarify the significant impact of the intervention program and medication on the learning disabilities for both study and control group, this matched with Imhof, M. (2004)²² mentioned that Positive effects of the color stimulation on graphomotor behavior control, consequently, on qualitative aspects of the handwritings.

CONCLUSION

The results of the current study revealed that the majority of the two groups reported that Attention Deficit Hyperactivity Disorder considered as a problem especially its difficult consequences on their children's behavior, social, emotional and learning abilities. Also, they express the difficulties in dealing with their children's hyperactivity, low academic achievements, how reinforce them, Both study and control group receive medications (Amoxiten, Antidepressant, Antipsychotic) study group only (children and parents) participated in intervention program results proved that the intervention program had an effective impact on attention of children with Attention Deficit Hyperactivity Disorder at Abo rish hospital.

RECOMMENDATIONS

Based on the previous findings of the present study. The following recommendations are suggested:

1. Annual screening for all school children for early detection.
2. Establish an ADHD center for caring children and their parents.
3. Reestablish the school nurse program and design training program about ADHD

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