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Relationship between Adaptive Functioning and Severity of Symptoms among Children with Attention Deficit Hyperactivity Disorder

¹Hanan Mahmoud Ali, ²Rania Rabie El-Etreby, ³Hala Ahmed EL boraie

¹ Demonstrator in Psychiatric and Mental Health Nursing Department Faculty of Nursing– Mansoura University.

² Lecturer of Psychiatric and Mental Health Nursing Department Faculty of Nursing– Mansoura University.

³ Professor of Psychiatric Medicine Faculty of Medicine Mansoura University, Head of Psychiatry Department, Mansoura University.

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Abstract: The study aims at assessing the relationship between adaptive functioning and severity of symptoms among children with Attention Deficit Hyperactivity Disorder (ADHD). A descriptive correlation design was used. The sample consisted of (100) children diagnosed by a psychiatrist as being affected with ADHD at psychiatric outpatient clinic in Mansoura University Hospitals (MUH). The collection of data was carried out through assessing the socio economic state of child parents using Socio Economic Status scale for health research in Egypt, ADHD level using Conners Parent Rating Scale (CPRS) and the adaptive functioning using Vineland Adaptive Behavior scale (VABS). Results revealed highly significant negative correlation between ADHD severity and adaptive behavior (communication, socialization, DLS, and motor skills) at $p < 0.001$. There is significant negative correlation between adaptive functioning and ADHD sub domains; conduct, psychosomatic, impulsive hyperactive and hyperactivity index at $p < 0.001$, anxiety at $p = 0.036$, while not significant with learning problem at $p = 0.219$. In conclusion, there is high significant relationship between adaptive functioning and severity of ADHD. Therefore, it is recommended for nurses to enhance adequate training about adaptive behavior for those children to minimize their dependence and disability.

Keywords: adaptive functioning, severity of ADHD, ADHD.

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) accounts the majority of referrals to child and adolescent psychiatry services, it affects between 5 and 12 per cent of children worldwide *Tasman [1]*. It is a common behavioral condition, it affects 11% of school-age children *Visser [2]*. ADHD is a persistent pattern of inattention and or hyperactivity-impulsivity that is more frequent and severe than is typically experiential in individuals at a similar level of development *APA [3]*.

Prevalence and prescribing rates for ADHD have elevated steeply over the past decade to some extent in response to concerns about under diagnosis and under treatment *Thomas [4]*. ADHD consequences on society are enormous in terms of financial cost, stress on families, impact on academic and vocational activities, and negative effect on self-esteem *El-tallawy [5]*. Symptoms continue into adulthood in more than three-quarters of cases *Brown [6]*.

There are three subtypes of ADHD; predominantly inattentive type that is characterized by most of the symptoms are in the inattention category *NIMH [7]*, predominantly hyperactive-impulsive in which most symptoms (six or more) are in the hyperactive-impulsive categories, although inattention may still be present to some degree *Videbeck [8]*, the third subtype is combined hyperactive-impulsive and inattentive that is characterized by presence of six or more symptoms of inattention and six or more symptoms of hyperactivity-impulsivity. Most children have the combined type of ADHD, globally two

thirds of ADHD cases of ADHD are in the class of combined type while the categories of the predominantly hyperactive, impulsive and the predominantly inattentive types account only for one third of ADHD cases *NIMH [7]*.

Hyperactive children have difficulty forming satisfactory interpersonal relationships. They demonstrate behaviors that inhibit acceptable social interaction. They are disruptive and intrusive in group endeavors. They have difficulty complying with social norms *Tasman [1]*. Children with combined type were rated as showing more aggressive behavior; furthermore, they displayed emotional dysregulation characterized by high intensity and high levels of both positive and negative behavior. In contrast, children with ADHD inattentive type was perceived as displaying social passivity and showed deficits in social knowledge on the self-report measure but did not evidence problems in emotional regulation *AHRQ [9]*.

Adaptive functioning is the usual performance of daily life activities and it is considered the ability to convert cognitive potential into real world skills *Pugliese [10]*. The American Association on Mental Retardation (AAMR) defined adaptive behavior as “the collection of conceptual, social, and practical skills that have been learned by people in order to function in everyday lives” *Matson & Glidden [11]*. It is best understood as the degree to which individuals are able to function, maintain themselves in dependently, and meet cultural expectations for personal and social responsibility at various ages. As such, adaptive behavior involves the person’s physical skills, cognitive ability, affect, motivation,

culture, socio-economic status, family, and environment Cassidy [12] & Tasee [13].

There is based relationship between ADHD and other behavioral problems also it's associated with decreased adaptive functioning including inability to proceed in normal social relations decreased ability to communicate properly, perform activities of daily living Ashwood [14]. It is asserted that there is involvement of inattention and hyperactivity symptoms in the adaptive functioning of persons with ADHD. Moreover, in spite of the pharmacological treatment, the persistence of the ADHD symptoms has a greater effect on the work and interpersonal domains Miranda [15].

High prevalence of ADHD among populations indicates a serious health problem, not only affects their lives but also their society this is much important in this study as the researcher targets children who represent future, as its increasing incidence that is revealed year by year will result in future harmful consequences on society and on world's economy as well as citizens health so it became important developing an evidence of the effect of adaptive functioning on severity of ADHD symptoms, moreover assessing adaptive behavior could be considered among the many variables for early indicating for ADHD, alleviating symptoms of it, enhancing better functioning and better health wellbeing.

AIM OF THE STUDY:

The study aims at assessing the relationship between adaptive functioning and the severity of ADHD symptoms among Egyptian sample of children with Attention Deficit Hyperactivity disorder.

SUBJECTS AND METHOD:

Study Design:

A descriptive research design was used.

Setting:

The study was carried at the Psychiatric Out-Patient Clinic of Psychiatry Department in Mansoura University Hospital (MUH). This hospital affiliated to the ministry of higher education and scientific research, which is, located in El-Mansoura city the capital of Dakahlia governorate in the Delta region.

Subjects:

A convenient sample of children diagnosed with ADHD attending the Psychiatric Out-Patient Clinic Department at (MUH) throughout four months, the data collection time for this study. The children number was 100; they were diagnosed by two psychiatrists who work at the outpatient clinic of (MUH).

Tools:

Three scales were used to collect data, which include the following:

- Scale I: Socioeconomic status scale for health research in Egypt. It has 7 domains with a total score of 84; they are Education and cultural, Family, Economic, Occupation, Family possessions, Home sanitation and

Health care domains ,El-Gilany, El-Wehady & El-Wasify [16].

- Scale II: The Conner's Parent Rating Scale (CPRS) is translated into Arabic by AL- Beheery [17] ; it is developed originally by Keith conners for children from 3-17 years of age. This scale contains six sub domains: conduct problem, learning problem, psychosomatic, impulsive hyperactive, anxiety problem and hyperactivity index. the scale consists of 48 questions pertaining to assessing the child behavioral problems, uses the responses to rate the examinee severity of symptoms (3:to a very great extent,2:to a great extent,1: to a limited extent,0:absolutely). The severity of ADHD symptoms is classified into mild, moderate, severe depending on the quartiles of score calculated. Internal consistency of the CPRS was determined using Cronbach's alpha technique as .0.75 and coefficients alpha is .0.85.
- Scale III: Vinland Adaptive Behavior Scale (VABS), it is translated into Arabic and validated by Aletiby [18] , It is used to measure an individual's adaptive level of functioning. Main subscales are Communication, Daily Living Skills, Socialization and Motor Skills. Internal consistency of the Arabic version of VABS was determined using Cronbach's alpha technique, which was .86 up to .97 in Arabic culture. Test retest revealed coefficients alpha from .7 to .99. Scoring system of VABS follows the following: high adaptive (<330), Moderate adaptive (270.5-330), Low adaptive (<270.5) based on quartiles of the scale calculated.

Ethical consideration:

- The permission was obtained from the faculty of nursing ethics committee and from the director of the association.
- Verbal or informed consent of the children's caregivers was obtained.
- Assuring care givers of children included in the study that all information gathered will be confidential.
- Informing parents of children with ADHD who participated in the study that they have right to withdraw from it at any time with no penalty.
- Any Participant refused to continue questionnaire was excluded from the sample size.

Statistical analysis:

Analysis of the data was carried out using SPSS (21). The data normality was tested first with one-sample Kolmogorov-Smirnov test. Qualitative data were described by number and percent. Continuous variables were accessible as mean \pm SD (standard deviation). The two groups were compared with Student t test while ANOVA test was used to compare more than 2 groups. Pearson correlation used to correlate continuous data. The significance is fixed at 5% level (p-value).

RESULT

Table (1): Socio Demographic Characteristics of the studied subjects:

Variables	Studied subjects (n=100)	
	No	%
Sex		
Male	60	60.0
Female	40	40.0
SES Classes		
High	21	21.0
Middle	27	27.0
Low	25	25.0
Very low	27	27.0

Table (1) reveals that more than half of the studied subjects (60%) are male gender, more than half of the studied subjects are low socio economic (52%), 27% are middle SES and only 21% are high SES.
*SES: Socio-Economic Status.

Table (2): Distribution of the studied subjects according to severity of ADHD:

Conner's Abbreviated Parent Scale	Studied subjects (n=100)	
	No	%
Mild ADHD	8	8.0
Moderate ADHD	43	43.0
Sever ADHD	49	49.0

Table (2) shows that about half of studied children (49%) had severe ADHD, low percentage (8%) of children had mild ADHD.

Table (3): Distribution of the studied subjects according to level of adaptive functioning on Vinland scale:

Vinland Adaptive Behavior Scale	Studied subjects (n=100)	
	No	%
High adaptive (>330)	51	51.0
Moderate adaptive (270.5-330)	24	24.0
Low adaptive (<270.5)	25	25.0

Table (3) indicates that more than half of the studied subjects (51%) have high adaptive functioning and quarter of the studied subjects (25%) had low adaptive functioning.

Table (4): Correlation between Vinland Adaptive Behavior scale and Conner's parent rating scale for ADHD and its subscales:

Conner's Abbreviated Parent Rating Scale for ADHD	Total Vinland Adaptive Behavior	
	R	P
Conduct score	-0.383	<0.001**
Learning problems score	-0.124	0.219
Psychosomatic score	-0.345	<0.001**
Impulsive hyperactive score	-0.416	<0.001**
Anxiety score	-0.210	0.036*
Hyperactivity index score	-0.413	<0.001**
Total score	-0.652	<0.001**

** Highly significant p <0.001, * significant p <0.05

Table (4) delineates high statistical significant negative correlation among studied subjects between adaptive functioning and ADHD severity where $r = -0.652$ at $p < 0.001$. Regarding ADHD sub domains, the highest negative correlation was between adaptive behavior score and hyperactive impulsive and hyperactivity index score $r = -0.416, -0.413$ at $p < 0.001, < 0.001$ respectively followed by conduct, psychosomatic score $r = -0.383, -0.345$ at $p < 0.001,$

0.001 respectively then come anxiety score $r = -0.214$ at $p = 0.036$ there was no correlation between adaptive function score and learning problem $r = -0.124$ at $p = 0.219$.

Table (5): Correlation between total Conner's Parent Rating Scale score for ADHD and Vinland Adaptive Behavior subScales:

Vinland Adaptive Behavior Scale	Total Conner's Parent Rating Scale for ADHD	
	R	P
Communication	-0.617	<0.001**
Socialization	-0.565	<0.001**
DLS	-0.647	<0.001**
Motor	-0.696	<0.001**
Total Vineland score	-0.652	<0.001**

** Highly significant p <0.001, * significant p <0.05

Table (5) reveals that here is high significant negative correlation between ADHD and adaptive behavior sub domains, the highest significant negative correlation was between ADHD score and motor skills $r = -0.696$ then come DLS $r = -0.647$ then communication $r = -0.617$ while the lowest correlation with socialization $r = -0.565$.

Table (6): Correlation between Vinland Adaptive Behavior Scale, Conner's Abbreviated Parent Rating Scale and family Socio Economic Status:

Variables	Vinland Adaptive Behavior Scale		Conner's Abbreviated Parent Scale	
	R	P	R	P
SES	0.132	0.189	-0.113	0.262

Table (6) reveals that there is no statistically significant correlation between adaptive behavior, ADHD level and socio economic state of the studied subjects where $r = 0.132, -0.113$ at $p = 0.189, 0.262$ respectively.

DISCUSSION

This chapter discusses the results of this study, compares them with other concerned studies, recent literature, besides it also represents the researcher's interpretations of the present results.

Biological profile (gender) of the studied children demonstrates that more than half of the studied subjects were males. The study results are matching with DSM5 criteria according to APA (2013) regarding ADHD prevalence that males outnumbered females diagnosed with ADHD.

The findings are congruent with several studies for instance in Egypt, *El-Wassify [19]*, *El-hay & Sawy [20]*, *El-tallawy [5]*, *El-nemr [21]*, admitted that males with ADHD outnumbered females diagnosed with ADHD and the ratio was about 2:1, while *Aboul-ata & Amin [22]* estimated the prevalence of ADHD in Fayoum city and it was 20.5%, with 33.8% among boys and 6.8% among girls. In foreign countries, *Sulaiman & Shakir [23]*, in Erbil city the ratio of males to females with ADHD was 2:1 and *Leasha M. Barry [24]* asserted that males outnumbered females in diagnosis of ADHD.

Regarding socioeconomic state of the studied subjects (parents) about half of the subjects have low family socioeconomic standard and there is no significant relation between SES and ADHD. The study result supported by

Lavigne [25] that ADHD affects children of all races and social classes. Controversially, Sulaiman & Shakir [23] admitted high significant positive relation between ADHD and high socioeconomic status and high educational level of parents of children that higher proportion of ADHD are found among higher socio-economic status.

The research results in the point of socioeconomic status may be attributed to that those who are high in socioeconomic status and educated parents become more aware of their children behaviors, identify abnormality rapidly, seek health care at earlier age, help their children solve their abnormal behaviors on specialized health settings while others who are low and very low socioeconomic status may not notice any abnormality or seek help until teachers refer their students to health settings.

Results reveal there was no significant relation between the socio economic standard and the adaptive functioning level, the study result is congruent with Ashwood [14], that persons adaptive functioning could be influenced by a variety of factors such as motivation, personality characteristics, which take its turn in leveling adaptive functioning.

Regarding severity of ADHD, about half of the studied subjects are diagnosed with severe ADHD, great percentage had moderate ADHD symptoms and low percentage of children had mild ADHD. This may be attributed to the diminished parent role that the illness most commonly misunderstood as normal hyperactive behavior and even not dealt with as a disorder until the child enters school.

The study results regarding levels of adaptive functioning showed that more than half of subjects have high adaptive functioning, and quarter had low adaptive functioning which is respected percent that validate the idea that symptoms of ADHD impairs adaptive functioning but generously ADHD symptoms don't affect cognitive abilities to great extent, mostly it is behavioral disorder concerning behavior like conduct, anxiety, psychosomatic hyperactivity, impulsive behavior besides learning behavior.

Regarding the correlation between adaptive functioning and ADHD score, results delineated that there was high statistical significant negative relation among studied subjects between adaptive functioning and ADHD severity, the same correlation was also presented with some sub domains of ADHD like conduct disorder, psycho somatic behavior, impulsive hyper active behavior, hyper activity index respectively, this correlation was significant with anxiety in contrast there was no significant relation between adaptive functioning level and learning problems.

The study results are matching with several studies like Sikora [26], Yerys [27], Miranda [15], Perveen [28] and Willer [29], that children diagnosed with ADHD obtained statistically significant lower scores on all domains (Communication, Daily Living Skills, Socialization, and Adaptive Composite, while Willer [29] reported that children with ADHD exhibit insufficient motor ability and asserted negative relationship between motor ability and ADHD scores.

The study results may be attributed to that the exacerbated impairments in the daily living skills domain result from increased deficits in executive functioning in children with ADHD and associated difficulties in organization and planning, which are key cognitive skills needed for everyday routines, such as eating, dressing, showering, and brushing one's teeth. Disorganization is one of the inattention symptoms for an ADHD diagnosis.

Absence of significant relation between adaptive functioning and learning problems in this study may related to that learning system in our culture especially in Egypt not based how to socialize, to communicate, how to utilize motor capacities, that it does not reflect the function of human being, to succeed in Egypt not depend on level of adaptive functioning.

CONCLUSIONS AND RECOMMENDATIONS

It could be concluded that there was significant negative relationship between adaptive functioning and severity of ADHD and its subdomains which are (impulsive hyperactive, hyperactivity index, conduct, and psychosomatic behaviors) and significant negative relationship with anxiety, whereas there was no statistically significant relationship between adaptive functioning and learning problems.

It is recommended to: Implement adaptive functioning assessment methods in assessing prognosis or progress of ADHD, integrate programs based on adaptive functioning in psychotherapy and family therapy to help those with ADHD and integrate courses in developing adaptive functioning in nursing curriculum to enhance nurses to identify the level of adaptive functioning of patients and help in the process of developing it.

LIMITATIONS OF THE STUDY

The children and their parents data in the outpatient clinic wasn't recorded electronically, the time required to collect data from parents was relatively long it may take from 50-60 minutes to collect data from each participant and the researcher collected data by asking all questions to many illiterate participants included in the study, Also relatively small sample size (100) ADHD children who included in the study.

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