

## Quality Of Life In Attention-Deficit/ Hyperactivity Disorder In Different Age Groups

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## Abstract

**Background:** Attention- deficit/ hyperactivity disorder (ADHD) represents one of the most prevalent childhood psychiatric disorders. Untreated ADHD is likely to have negative impact on most domains of quality of life (QoL).

**Aim of the study:** To evaluate the quality of life (QoL) of children and adolescents with Attention Deficit Hyperactive Disorder (ADHD) in different age groups who attend the clinics of the Faculty of Postgraduate Childhood Studies (FPGCS), Ain Shams University.

**Study design:** Case- control study.

**Methods:** 5 groups were included in this study from age 4 to 18 years old.

All subjects were subjected to full medical history and general clinical examination, psychiatric history and examination according to the psychiatric sheet of the clinic of the FPGCS, psychological assessments using Stanford Binet 5th edition and Attention Deficit Hyperactivity Disorder symptoms were rated according to The Conners Comprehensive Behavior Rating Scale for diagnosis and severity. QoL was measured with a questionnaire using the Pediatric Quality of Life Generic Core Inventory version 4.0 (PedsQL) and family socioeconomic status of the cases was measured using Al- Shakhs 2013 rating scale questionnaire. The collected data were analyzed using (Statistical Package for Social Sciences) software version 12.0, IBM Corp., Chicago, USA, 2004.

**Results:** There was group matching between ADHD and control research groups as regards demographic characteristics. Socioeconomic classes were closely matched (P value=0.236). Most of the studied ADHD cases had moderate ADHD severity 40.4% of the studied data. Sex differences shows male predominant in all severities, P= 0.039. Regarding Socioeconomic classes, severe form of ADHD was found among lower socioeconomic class (64.5%), highly significant results  $p < 0.001$ . Physical functioning score statistically significantly decreased as ADHD severity increased. (p value <0.001) Other scores and total score significantly increased as ADHD severity increased (p value <0.001). Health and activities score decreased as ADHD severity increased. Other scores and total score increased as ADHD severity increased in a statistically significant manner (p value <0.001).

**Conclusion:** Quality of life is negatively affected in children having ADHD with male affecting more than female in physical domains and lower social class was negatively affected more than high social class patients.

**Keywords:** ADHD, Attention deficit hyperactive disorder, Quality of life, QoL, PedsQL, Socioeconomic, Egypt.

## جودة الحياة لدى الأطفال المصابون باضطراب فرط الحركة وتشتت الانتباه في الفئات العمرية المختلفة

هدف هذه الدراسة إلى فحص واستكشاف الجوانب المختلفة لإضطراب فرط الحركة وتشتت الانتباه، توفير معلومات أكثر شمولاً لإراء انتشار ADHD، كيف يختلف انتشار المرض مع محددات مختلفة، تسليط الأضواء على الاتجاهات الجديدة وخطوط جديدة لعلاج هذا الاضطراب.

**المنهجية:** تم إخضاع جميع المرضى إلى: فحص نفسي كامل وفحص الحالة العقلية وفقاً لنموذج الصحيفة النفسية من كلية الدراسات العليا للطفولة، التاريخ الطبي الكامل والفحص الاكلينيكي، مقياس حاصل الذكاء باستخدام ستانفورد بينيه الطبعة الخامسة، مقياس جودة الحياة لدى الأطفال النسخة الرابعة عربي، مقياس الدكتور عبدالعزيز سيد الشخص للمستوى الاقتصادي للأسر المصرية ٢٠١٣. تم إدخال البيانات التي تم جمعها وتنظيمها وجدولتها وتحميلها على جهاز الحاسوب الشخصي باستخدام SPSS الإصدار ٤ لسنة ٢٠١٢.

**النتائج:** بينت نتائج هذه الدراسة ان جودة الحياة لدى الأطفال الذين يعانون من فرط الحركة وتشتت الانتباه أقل بشكل ملحوظ من الأطفال الذين لا يعانون من هذا الاضطراب. كما بينت الدراسة ان شدة الاضطراب تتمثل بصورة أقوى عند البنين عن البنات من ناحية التأثير السلبي على الحالة الجسدية. بينت الدراسة أيضا ان البنات الذين يعانون من هذا الاضطراب اشد تأثراً بالسلب من ناحية الحالة المزاجية والشعور بالحزن. عدد ١١٦ حاله من أصل ٢٨٧ حاله مصابة بالاضراب تعاني من شدة متوسطة من الاضراب متمثلة بنسب ٤٠,٤٠%، بينما يعاني ٦٤ حاله باضطراب بسيط بنسبه ٢٢,٣% من اجمالى الحالات بينما يعاني ١٠٧ حاله باضطراب شديد بنسبة ٣٧,٣%.

**الكلمات المفتاحية:** الأطفال- فرط الحركة وتشتت الانتباه- جودة الحياة- مصر.



## Introduction:

Attention- deficit/ hyperactivity disorder (ADHD) represents one of the most prevalent childhood psychiatric disorder. However, due to public unawareness, it is one of the most neglected and misunderstood condition and usually considered a social stigma.<sup>(1),(2)</sup>

The lack of diagnosis and proper treatment and support often results in a negative impact on the quality of life of the affected individual and their families. It affects the academic performance, social relationship, results in a negative self- esteem and can result in early school leaving.<sup>(3),(4)</sup>

ADHD is a multifaceted disorder that varies in its types and severity of its symptoms.<sup>(5),(6)</sup> It includes some combination of neurobehavioral problems, such as difficulty sustaining attention, hyperactivity and impulsiveness.<sup>(7-9)</sup>

It often persists into adulthood and can profoundly affect the academic achievement, well- being, and social interaction.<sup>(10-13)</sup>

The core domains of QoL are assessed by culturally sensitive indicators. These domains have been validated in many cross cultural studies.<sup>(14-18)</sup>

Although these domains are the same for all people, their importance is influenced by personal characteristics and environmental variables.<sup>(19-21)</sup>

Individuals with mental health problems and intellectual disabilities including those of behavioral problems, are among the most vulnerable group of people to have lowered QoL. Untreated ADHD is likely to have negative impact on most domains of QoL.<sup>(7),(13),(20)</sup>

## Aim:

To evaluate QoL of children and adolescents with ADHD in different age groups who attend the clinics of the Faculty of Post graduate Childhood Studies.

## Methodology:

A Case Control study conducted at the outpatient clinics of the Faculty of Postgraduate childhood Studies, Ain Shams University. Data used in this study are primary data of children and adolescents diagnosed with ADHD who participate in the study and or their parents.

Study group involved children diagnosed with ADHD of age range of 4 to 18 years who attended the outpatient clinics of the Faculty of Post Graduate Childhood Studies throughout one year duration. Control research group: Children and adolescents without any psychological or medical problems matched for sex and age range.

✦ Inclusive Criteria: Children and adolescents diagnosed with ADHD (according to DSM- V criteria) of the age range of 4 to 18 years of both sexes, cases diagnosed with ADHD, cases with average and above average IQ levels (70 to 120).

✦ Exclusive Criteria: Cases primary diagnosed with other psychiatric disorders e.g. learning disorders, conduct disorder, oppositional defiant disorder, anxiety or depression and cases with ADHD of IQ levels below 70.

✦ Grouping: Children and adolescents were grouped according to their age into: Preschoolers (3- 5 years old), early childhood (6- 8 years old),

middle childhood (9- 11) years old, young Teens (12- 14) years old, Teenagers (15- 17) years old.

All study subjects were subjected to the following: full medical history of previous illness and general medical examination, Psychiatric history and examination using the psychiatric sheet of the Faculty of Post Graduate Childhood studies, Intelligence quotient measurement using Stanford Binet 5<sup>th</sup> edition, Conners Behavioral rating scale short form and socioeconomic rating scale.

## Questionnaires:

1. The Conners Comprehensive Behavior Rating Scale to diagnose and specify the severity of ADHD and to better understand certain behavioral, social, and academic issues
2. Pediatric Quality of Life Generic Core Inventory version 4.0 (PedsQL) which is a licensed certified questionnaire was used to be completed by parents of children and adolescents with ADHD. Another questionnaire to be completed by older children (above 10 years of age) or by adolescents from the same company.
3. Abdel Aziz Sayed Alshakhs rating scale for socioeconomic status of the Egyptian population 2013.

## Scoring:

1. Conners rating scale is designed to be comprehensive, and measures many behavioral markers, including signs of: Hyperactivity, aggressive behavior, potential for violence, compulsive behaviors, perfectionism, difficulty in class, extra trouble with math, difficulty with language, social issues, emotional distress and separation anxiety. It measures 18 symptoms of ADHD which are 9 for inattention (statement 1- 9, and 9 for hyperactivity/ impulsivity (statement 11- 19), besides 9 symptoms of ODD/ CD (statement 21- 29) as specified by DSM- IV. Other comorbidities are inquired by one or two statements. The psychologist added up the scores from all the areas of the assessment and compare them to the scores of others in the child's age group to get their standardized scores, these scores are called T- scores. A T- score of more than 60 can indicate that the child has mild ADHD. A T- score greater than 60 but under 70 may indicate moderate ADHD. A T- score above 70 may be a sign that the behavioral, academic, or emotional problems are severe.
2. PedsQL: 5- point Likert scale from 0 (Never) to 4 (Almost always) 3- point scale: 0 (Not at all), 2 (Sometimes) and 4 (A lot) for the Young Child ages (5- 7) child report. Scores are transformed on a scale from 0 to 100
3. AbdEl Aziz Sayed Alshakhs Socioeconomic status scale: The score was obtained using the following equation:

$$X = 0.73 + 0.264 \times S1 + 0.284 \times S2 + 0.102 \times S3 + 0.16 \times S4 + 0.125 \times S5$$

Where X represents the Socioeconomic standard, S1 is the monthly income of both parents ranging from 1 to 7 degrees, S2 and S4 are the parents' jobs' score ranging from 1 to 9 degrees, S3 and S5 are the parents' education's score ranging from 1 to 8 degrees.

**Statistical Methods:**

The collected data were coded, tabulated, and statistically analyzed using IBM SPSS statistics (Statistical Package for Social Sciences) software version 12.0, Chicago, USA, 2004.

Inferential analyses were done for quantitative variables using independent t- test in cases of two independent groups and ANOVA test with post hoc Bonferroni test for more than two independent groups. In qualitative data, inferential analyses for independent variables were done using Chi square test for differences between proportions with post hoc Bonferroni test. The level of significance was taken at P value <0.050 is significant and at <0.010 is highly significant, otherwise is non-significant.

**Ethical Approval:**

A written consent is obtained from parents of children and adolescents involved in the study. A verbal consent is taken from children and adolescents themselves. Assurance of privacy and confidentiality of their information and answers is given to all participants.

**Results:**

Table (1) Comparison between ADHD cases and control groups regarding demographic characteristics

Group Variables		ADHD (N= 287)	Control (N= 287)	X <sup>2</sup> - Value	#P
Age	Preschoolers	23 (8.0%)	23 (8.0%)	-	-
	Early Childhood	85 (29.6%)	85 (29.6%)		
	Middle Childhood	137 (47.7%)	137 (47.7%)		
	Young Teens	42 (14.6%)	42 (14.6%)		
Sex	Male	180 (62.7%)	180 (62.7%)	-	-
	Female	107 (37.3%)	107 (37.3%)		
Socioeconomic Class	Low	145 (50.5%)	136 (47.4%)	2.892	0.236
	Middle	138 (48.1%)	141 (49.1%)		
	High	4 (1.4%)	10 (3.5%)		

Table (1) shows that there was group matching between ADHD and control research groups as regards demographic characteristics. Socioeconomic classes were closely matched with P value= 0.236.

Table (2) Comparison according to ADHD severity regarding demographic characteristics among ADHD group

Variables		Mild (N=64)	Moderate (N=116)	Severe (N=107)	P
Age	Preschoolers	19 (29.7%)a	4 (3.4%)b	0 (0.0%)b	<0.001**
	Early Childhood	28 (43.8%)	34 (29.3%)	23 (21.5%)	
	Middle Childhood	12 (18.8%)	68 (58.6%)	57 (53.3%)	
	Young Teens	5 (7.8%)	10 (8.6%)	27 (25.2%)	
Sex	Male	40 (62.5%)a	82 (70.7%)a	58 (54.2%)b	0.039*
	Female	24 (37.5%)	34 (29.3%)	49 (45.8%)	
Socioeconomic Class	Low	21 (32.8%)a	55 (47.4%)a	69 (64.5%)b	<0.001**
	Middle/High	43 (67.2%)	61 (52.6%)	38 (35.5%)	

#Chi square test. \*Significant. \*\*Highly significant. Homogenous groups had the same letter (a, b) according to post hoc Bonferroni test

Table (2) shows that severe form of ADHD was (0.0%) in preschooler age group in comparison to (53.3%) in the middle childhood, while moderate form of ADHD was highest among the middle childhood (58.6%), highly significant results p<0.001. Sex differences shows male predominant in all severities. Significant result P= 0.039.

Regarding Socioeconomic classes, severe form of ADHD was found

among lower socioeconomic class (64.5%), highly significant results p< 0.001

Table (3) Comparison according to age regarding quality of life (PedsQL) among ADHD group

Variables		3- 5 Yrs (N= 23)	6- 8 Yrs (N= 85)	9- 11 Yrs (N= 137)	12- 14 Yr (N= 42)s	P
Physical Functioning	Walk	76.1±19.2a	79.1±14.4a	83.9±12.0b	94.0±10.8c	<0.001**
	Run	68.5±22.9a	73.5±17.4a	80.8±14.9b	92.9±13.8c	<0.001**
	Sport	75.0±19.9a	76.8±16.3a	82.8±13.5a	92.9±13.8b	<0.001**
	Lift	82.6±11.8a	81.2±10.8a	83.8±12.0a	94.0±10.8b	<0.001**
	Shower	66.3±12.2a	61.8±15.7a	62.4±19.4a	40.5±34.9b	<0.001**
	Chores	51.1±20.6a	52.6±19.3a	57.8±20.1b	39.3±35.0b	<0.001**
	Ache	82.6±11.8a	81.2±13.3a	85.8±12.4a	95.8±9.4b	<0.001**
	Energy	83.7±12.2a	82.6±12.8a	87.2±12.5a	97.0±8.2b	<0.001**
Physical Functioning Score		73.2±15.1a	73.6±12.3a	78.1±10.5b	80.8±10.3b	<0.001**
Emotional Functioning	Scared	98.9±5.2a	86.2±13.1a	79.7±11.9b	86.9±15.8c	<0.001**
	Sad	87.0±12.8a	78.2±12.7a	74.8±12.3b	83.9±17.3c	<0.001**
	Angry	73.9±5.2a	55.9±19.2b	44.7±20.2c	26.8±28.4d	<0.001**
	Sleeping	68.5±11.2a	50.3±20.2b	41.6±20.8b	25.6±28.4c	<0.001**
	Worry	73.9±5.2a	53.5±20.5b	42.3±20.7b	26.2±28.7c	<0.001**
	Emotional Functioning Score		80.4±6.0a	64.8±15.0a	56.6±14.3b	49.9±16.9c
Social Functioning	Getting Along	73.9±5.2a	53.5±19.7b	42.2±19.6c	26.2±28.1d	<0.001**
	No Friend	75.0±0.0a	57.6±19.7b	48.0±21.4b	28.6±30.0c	<0.001**
	Others Tease	79.3±9.7a	62.1±19.9b	52.4±21.0b	31.0±31.1c	<0.001**
	Do As Others	80.4±10.5a	62.1±19.9b	52.9±19.9b	34.5±28.7c	<0.001**
	Keep Up With Peers	80.4±10.5a	57.4±22.8b	44.9±21.9c	26.8±28.9d	<0.001**
	Social Score	77.8±6.2a	58.5±19.5b	48.1±19.7b	29.4±28.8c	<0.001**
School Functioning	Attention	75.0±0.0a	57.9±19.7b	47.8±21.5b	28.6±29.5c	<0.001**
	Forgetting	75.0±0.0a	57.1±19.5b	46.4±20.9b	27.4±29.1c	<0.001**
	Work Trouble	75.0±0.0a	58.2±19.8b	48.4±21.5b	29.2±29.7c	<0.001**
	Miss Due To Illness	85.9±12.7a	63.2±22.4b	52.6±23.3b	32.1±34.2c	<0.001**
	Miss Due To Doctor	89.1±12.7a	67.6±21.8b	58.4±22.5b	41.7±34.3c	<0.001**
	School Functioning Score		80.0±4.8a	60.8±19.8b	50.7±21.1b	31.8±30.8c
Total Score		77.3±6.9a	65.6±9.8b	60.9±11.2b	52.3±17.0c	<0.001**

^ANOVA test. \*\*Highly significant. Homogenous groups had the same letter (a, b, c) according to post hoc Bonferroni test

Table (3) shows that Total Scores, Physical functioning score statistically significantly increased as the age category increased (p value <0.001). Other scores and total score significantly decreased as the age category increased (p values<0.001).

Table (4) Comparison according to social class regarding quality of life (PedsQL) among ADHD group

Variables		Low (N= 145)	Middle/High (N= 142)	^P	
Physical Functioning	Walk	86.6±12.5	80.1±15.0	<0.001**	
	Run	84.1±14.7	74.6±19.1	<0.001**	
	Sport	86.2±12.8	77.5±17.4	<0.001**	
	Lift	86.4±12.5	82.4±11.5	0.005**	
	Shower	59.7±24.3	59.0±20.3	0.798	
	Chores	55.3±23.6	50.7±23.1	0.093	
	Ache	87.9±12.5	83.3±13.2	0.002**	
	Energy	89.5±12.4	84.5±12.9	0.001**	
	Physical Functioning Score		79.5±10.3	74.0±12.3	<0.001**



Variables		Low (N= 145)	Middle/High (N= 142)	^p
Emotional Functioning	Scared	82.8±13.3	85.7±13.8	0.064
	Sad	77.4±14.5	78.9±13.1	0.372
	Angry	43.6±23.7	51.9±23.1	0.003**
	Sleeping	40.2±24.3	47.9±22.6	0.006**
	Worry	41.4±24.2	50.4±23.6	0.002**
	Emotional Functioning Score	57.1±16.1	63.0±16.2	0.002**
Social Functioning	Getting Along	41.6±23.2	50.0±23.3	0.002**
	No Friend	45.9±24.7	54.6±23.6	0.002**
	Others Tease	49.8±25.1	58.8±24.0	0.002**
	Do As Others	50.9±23.3	59.5±23.4	0.002**
	Keep Up With Peers	44.0±25.4	53.7±26.3	0.002**
	Social Functioning Score	46.4±23.5	55.3±23.3	0.001**
School Functioning	Attention	46.0±24.4	54.4±23.9	0.004**
	Forgetting	44.7±24.1	53.5±23.6	0.002**
	Work Trouble	46.2±24.4	55.1±23.7	0.002**
	Miss Due To Illness	51.0±28.2	59.9±26.3	0.007**
	Miss Due To Doctor	57.1±26.5	65.3±25.8	0.008**
	School Functioning Score	49.0±24.8	57.6±23.9	0.003**
	Total Score	60.8±13.8	64.0±12.0	0.037*

^Independent t- test. \*Significant. \*\* Highly significant.

Table (4) shows that: Total Scores Physical functioning scores were statistically significantly higher among low social class (p value <0.001). Other scores and total score were statistically significantly lower among low social class.

**Discussion:**

The quality of life of children having attention- deficit/hyperactivity disorder haven't been investigated sufficiently in Egypt although there is substantial consideration as regards prevalence, illness duration, and sociopsychological impacts. The aim of the current study was to reveal and display the QoL of various age groups with ADHD.<sup>(1),(10)</sup>

Attention- deficit/ hyperactivity disorder is well known as one of the most frequent neuropsychiatric disorders, chiefly affecting pediatric age groups with a global prevalence of around 5.1% below the age of 18 years as shown by previous research groups of investigators.<sup>(2),(12)</sup>

The PedsQL™ Measurement Model is a modular approach to measuring health- related quality of life (HRQOL) in healthy children and adolescents and those with acute and chronic health conditions. The PedsQL™ Measurement Model integrates seamlessly both generic core scales and disease- specific modules into one measurement system. The items of this questionnaire cover the core health dimensions delineated by the WHO (physical, social, and emotional functioning), as well as role (school) functioning.<sup>(3),(19)</sup>

Pediatric age groups having ADHD usually have low levels of academic achievement, social performance impairments. The ADHD chronic nature and its sequelae negatively impact on one or more of the qualities of life components within pediatric age groups affected.<sup>(6)</sup>

Quality of life is a quantitative assessment approach of wellness and a relevant "Patient- reported outcome" as it mirrors the subjective perception of health. Quality of life is valuable in explaining the interventional approaches effectiveness, in which treatment evaluation should not be

based only on its therapeutic influence, but also on more satisfactory social, psychological, and physical values.<sup>(7),(9)</sup>

In the current study there was group matching between ADHD and control research groups as regards demographic characteristics. Socioeconomic classes were closely matched with P value= 0.236. Most of the studied ADHD cases had moderate ADHD severity. (n= 116 cases representing 40.4% of the ADHD cases total number). Severe form of ADHD was (0.0%) in preschooler age group in comparison to (53.3%) in the middle childhood, while moderate form of ADHD was highest among the middle childhood (58.6%), highly significant results p< 0.001

Besides the current study findings as regards Sex differences shows male predominant in all severities. Significant result P= 0.039. Regarding Socioeconomic classes, severe form of ADHD was found among lower socioeconomic class (64.5%), highly significant results p< 0.001.

The current study comparative analysis according to age regarding quality of life (PedsQL) among ADHD group as regards Physical functioning domain: Involving Walk, Run, Sport, Ache and Energy scores statistically significantly increased as the age category increased (p values< 0.001). Shower score statistically significantly decreased as the age category increased (p value <0.001). Chores scores statistically significantly increased as the age category increased then decreased at (12-14) years (p value< 0.001). As regards Emotional functioning domain, all emotional functioning scores statistically significantly decreased as the age category increased (p value <0.001). Concerning Social functioning domain, all social functioning scores statistically significantly decreased as the age category increased (p value< 0.001). As regards the School functioning domain all school functioning scores statistically significantly decreased as the age category increased (p value< 0.001). Finally total scores have shown that physical functioning score statistically significantly increased as the age category increased (p value< 0.001). Other scores and total score significantly decreased as the age category increased (p values< 0.001).

A Previous study investigating the quality of life of college students affected by ADHD disorders have revealed and displayed among its research findings that individuals with ADHD were statistically significantly more likely to show lower levels of well- being as regards domains of general health e.g. stress, sleep quality, sadness, anxiety, loneliness, exercise, and suicidal ideation (p values <0.001 for all categories). Those research findings after analysis have leded the investigators to conclude that college students diagnosed having ADIID suffer considerably lower levels of general well- being. Those findings in addition are greatly like the current study findings as regards the sadness, anxiety and exercise items although the current study involved various age groups involving preschoolers, schoolers and teenagers therefore covering a wider scope of age groups.<sup>(7),(14)</sup>

A prior research systematic review in an interesting manner have shown that ADHD impact a child's or adolescent's health- related quality of life in a negative manner with a moderate Influence on physical activity

levels and a severe impact on psychosocial functional domains.<sup>(15),(17)</sup>

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