

# QUALITY OF LIFE IN ATTENTION DEFICIT HIPERACTIVITY DISORDER AND AUTISM SPECTRUM DISORDER

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## ABSTRACT

Although both Autism Spectrum Disorder (ASD) and Attention Deficit Hyperkinetic Disorder (ADHD) are developmental neuropsychiatric disorders and are diagnosed in childhood, a lot of studies evaluated the quality of life (QoL) and concerns of the parents of children diagnosed with ADHD, but very few studied QoL in ASD or compared the two disorders. We conducted a clinical study on children and adolescents with ASD and ADHD, aiming to assess their QoL and to identify the lower rated domains for each disorder. 50 patients were enrolled in the study of which 25 with a diagnosis of ADHD and 25 with a diagnosis of ASD. Parents were asked to complete the CHIP-CE and a questionnaire containing items about the patient, family history, living conditions, familial relationships, education. The statistical analysis revealed statistically significant differences between the two categories of diagnosis in terms of the following dimensions of QoL: health status and self-esteem, comfort - physical and emotional symptoms, activities limitation due to the illness, achievements - academic performance, relationships with peers. The areas evaluated by the Child Health and Illness Profile (CHIP-CE/CRF) can provide information on the impact of developmental disorders, which are not evident through the assessment of symptoms. By understanding how the quality of life is affected by these disorders, the needs of children with ASD or ADHD will be better recognized, and the necessary therapy and support services will be developed accordingly.

**Keywords:** Attention Deficit Hyperkinetic Disorder (ADHD), autism spectrum disorder (ASD), quality of life, children, and adolescents.

## INTRODUCTION

Across all health and rehabilitation professions, quality of life (QoL) is an important measure of outcomes in both research and clinical setting [1]. Quality of life is affected by many factors including many proximal and distal influences such as, physical factors (diet, exercise, and hygiene), emotional factors (perceived levels of dignity, autonomy, and social acceptance) and social factors (support from family, and friends, culture etc.) [2]. Levels of income, the general state of the environment around a person as well as cultural influences also affect quality of life. Attention-deficit/hyperactivity

disorder (ADHD) is a psychiatric disorder marked by an ongoing pattern of inattention and/or hyperactivity-impulsivity that interferes with normal functioning or development [3]; it is also one of the most common neurodevelopmental disorders [4-6]. The patients diagnosed with ADHD, require a complete assessment by different clinicians, with expertise in ADHD. ADHD was once believed to affect only children; however, it is now understood that the symptoms of ADHD persist past childhood and adolescence. The detrimental impact that ADHD has on several life domains such as general health, college education, social life and psychological health is well

documented [7]. Studies assessing ADHD have consistently shown that the condition reduces the quality of life of children and adolescents, in subjective terms. ADHD has a comparable overall impact on quality of life as other mental health conditions or severe physical disorders. Increased symptoms level and impairment predicts poorer quality of life [8]. Children with the disorder are known to be at a greater risk for long term negative outcomes, such as lower educational achievements and employment attainment. When it comes to education, there is a major risk for hidden disabilities such as learning disabilities, and other psychiatric disorders. College students suffering from ADHD have a higher risk of experiencing academic or psychological difficulties, while children with ADHD are more likely to encounter rejection from their peers and negative interactions at home [9].

Autism spectrum disorder (ASD) is a complex developmental disability; signs typically appear during early childhood and affect a person's ability to communicate and interact with others. ASD is defined by a certain set of behaviours and is a "spectrum condition" that affects different individuals differently and to varying degrees [10]. Behaviours associated with ASD include difficulty in making eye contact, delayed learning of language, difficulty with executive functioning, and poor motor skills and sensory sensitivities. The family of a child with autism need to devote a lot of time to their child daily life needs and restrict their own activities to meet them, this will surely have a huge impact on their life outside the home, including their jobs and social interactions [11]. Children with autism tend to have poor academic achievements due to the nature of the disorder which results in: poor social and adaptive functioning behaviours, isolation and learning difficulties [12]. Moreover, the high level of stress that parents may be under tends to have a negative impact

on the child's behaviour and response to therapy [13]. Studies on the quality of life of children with autism and their families have shown that these families have a high level of stress compared to the families of children with other physical diseases and cognitive disabilities, for example Down's syndrome or cystic fibrosis. Adolescents and children with ASD have consistently scored lower on QoL, particularly on social domains, compared to controls. QoL/HQoL in children and youth with ASD was significantly poorer than that of the general population [14]. Lower QoL in children and youth with ASD was found to be in relation to higher levels of autism traits (i.e., more severe symptoms). A study showed that children with ASD reported a lower QoL in all sub domains (physical, emotional, social, etc.) compared to controls. On the other hand, in the same study IQ (over 70) and language development did not appear to influence QoL scores at all [15]. In summary, adolescents, and children with ASD tend to show an overall lower QoL compared to controls and the children and youth with other conditions.

A study showed impairment in adaptive functioning and a poorer QoL for children with autism as compared to children with ADHD [16]. Data from literature suggested that 1/3 of ASD children also exhibit symptoms of ADHD, and autistic patients were shown to have a lower QoL in comparing with ADHD patients [17]. Other results suggest a poorer health related quality of life (HQoL) for children with ASDs and clinically significant ADHD symptoms, in comparison with children with ASD and fewer ADHD symptoms [18]. Higher ASD symptoms have been associated with poorer family quality of life (FQoL) across all domains which are: emotional impact, family impact and time impact. Comparing the impact on QoL, in children suffering from ADHD, ASD, or anxiety disorders, it was found that anxiety disorders had the least impact on QoL, while

children with ASD had the lowest QOL. It should be noted however, that children with anxiety disorders scored lower on social functioning than children with ADHD [19].

We expect our results to be consistent with previous research and to bring new insights on the quality of life of children with ASD and ADHD from Romania. Our study main objectives were 1) to assess the quality of life for children diagnosed with ASD, compared with that of children diagnosed with ADHD, and 2) to identify the lower rated domains that affect their quality of life.

## **2. METHOD**

### **2.1. Sample**

The study included 50 children aged 6 to 14 years, diagnosed with ASD or ADHD, according to international diagnosis criteria DSM 5 and ICD-10 and their parents, which were distributed into two groups according to diagnosis (ASD or ADHD). Children and adolescents included in the study were recruited between January 2017 and May 2017. They were patients in the Child and Adolescent Psychiatry Clinic from Cluj-Napoca, Romania.

We included in the study: boys or girls with ages between 6 and 14 years, with diagnosis of autistic spectrum disorder (ASD) or attention deficit hyperactivity disorder (ADHD), according to DSM 5 international criteria; consent of parents to be included in the study.

We excluded from the study: the children with a known medical condition (heart or lung, chronic disorders);  $QI < 70$ ; children who suffered accidents or had major stressor in the last six months, which may significantly affect the quality of life; the children placed in foster care. The study was conducted in compliance with the international ethical standards. Data were used ensuring the privacy and subject's identity protection.

### **2.2. Instruments**

Child Health and Illness Profile (CHIP-CE/CRF) provides a comprehensive assessment of health and can be rated by parents (20). CHIP-CE/CRF describes health aspects that can be influenced by health systems: satisfaction (health status and self-esteem) - 11 items, comfort (physical and emotional symptoms, activities limitation due to the illness) - 22 items, resilience (family support, child's coping skills, child's physical activity level) - 19 items, risk avoidance (assessment of child risk behaviours) - 14 items, achievements (academic performance, relationships with peers) - 10 items. Scores can be compared on several areas and populations. CHIP-CE is an instrument that allows health assessments constantly from childhood to adolescence, providing an assessment method for the social and health policies impact and therapeutic interventions results. Other data of interest were obtained through a questionnaire containing items about the patient, family history, living conditions, familial relationships, education.

### **2.3. Design**

We conducted a clinical, cross-sectional study on children and adolescents with autism spectrum disorder (ASD) and Attention Deficit Hyperkinetic Disorder (ADHD), aiming to assess their quality of life (QoL). Parents and children, who agreed to participate in the study, received additional information and signed the informed consent. Participants were assessed to review the psychiatric diagnosis and the inclusion and exclusion criteria for the study. Parents were asked to complete the CHIP-CE and a questionnaire containing items about the patient, family history, living conditions, familial relationships, education. Data were supplemented with information from the patients' charts and other medical documents.

## 2.4. Data analysis

Data were collected into a SPSS database (version 17). The QoL of children diagnosed with ASD was analyzed as compared to that of children diagnosed with ADHD, on the domains assessed by CHIP-CE. Univariate statistical analysis was used to describe the studied population and the data collected with CHIP-CE. Bivariate statistical analysis (Pearson correlation, t test for independent samples) was used to identify the significant associations between the groups. A two-tailed statistical significance level was set at  $p < 0.05$  for all analyses.

## 3. RESULTS

50 patients were enrolled in the study of which 25 with a diagnosis of ADHD and 25 with a diagnosis of ASD. In the group of children with ADHD, sex ratio (male:female) was 3.1:1 and in that of children with ASD diagnosis, of 3.1:1, also. Mean age of patients in ADHD group was 12.56 years ( $SD=2.14$ ) and 10.08 for the children with ASD ( $SD=2.94$ ). There were no sex differences between the groups. The groups of children with ADHD and ASD included both 6 girls and 19 boys. In both groups there was a predominance of male subjects. According to the literature, the prevalence of ADHD and ASD in boys is 4 times higher than in girls, the girls being

affected most severely. The gender difference is less understood. Most neurodevelopmental disorders are more prevalent in boys (ADHD, dyslexia, ASD, etc.). CHIP-CE questionnaire was filled in mostly by mothers. For the ADHD group, 7 fathers completed the questionnaire.

We calculated the mean and the standard deviations for each CHIP-CE subscale (health status and self-esteem, comfort - physical and emotional symptoms, activities limitation due to the illness, resilience - family support, child's coping skills, child's physical activity level, risk avoidance - assessment of child risk behaviours, achievements - academic performance, relationships with peers) for ADHD and ASD groups (Table 1).

To compare the QoL of children diagnosed with ASD or ADHD, we used the t test for independent samples. The independent variable was considered the diagnostic category, and the dependent variable, the satisfaction for each of the following dimensions of the quality of life: health status and self-esteem, comfort - physical and emotional symptoms, activities limitation due to the illness, resilience - family support, child's coping skills, child's physical activity level, risk avoidance - assessment of child risk behaviours, achievements - academic performance, relationships with peers. The statistically significant difference

**Table 1. Mean values and the standard variation on the five CHIP-CE subscales, comparatively between the two groups of subjects: ADHD, respectively ASD group**

	lot	N	Mean	Std. Deviation	Std. Error Mean
SATISFACTION DOMAIN	ADHD	25	3.31	.41	.08
	ASD	25	3.67	.58	.11
COMFORT DOMAIN	ADHD	25	3.74	.39	.07
	ASD	25	3.53	.26	.05
RESILIENCE DOMAIN	ADHD	25	3.44	.40	.08
	ASD	25	3.61	.27	.05
RISK AVOIDANCE DOMAIN	ADHD	25	3.79	.51	.10
	ASD	25	3.60	.63	.12
ACHIEVEMENT DOMAIN	ADHD	25	2.73	.50	.10
	ASD	25	2.34	.47	.09



**Table 2. Means and standard deviations for satisfaction subscale in the studied groups**

	lot	N	Mean	Std. Deviation	Std. Error Mean
<b>Satisfaction with Health</b>	ADHD	25	3.30	.35	.07
	ASD	25	3.51	.61	.12
<b>Satisfaction with Self</b>	ADHD	25	3.32	.71	.14
	ASD	25	3.95	.98	.19
<b>SATISFACTION DOMAIN</b>	ADHD	25	3.31	.41	.08
	ASD	25	3.67	.58	.11

**Table 3. Means and standard deviations for comfort subscale in the studied groups**

	lot	N	Mean	Std. Deviation	Std. Error Mean
<b>Physical Comfort</b>	ADHD	25	3.94	.56	.11
	ASD	25	3.70	.47	.09
<b>Emotional Comfort</b>	ADHD	25	3.36	.43	.08
	ASD	25	3.24	.33	.06
<b>Restricted Activity</b>	ADHD	25	4.18	.81	.16
	ASD	25	3.79	.34	.06
<b>COMFORT DOMAIN</b>	ADHD	25	3.74	.39	.07
	ASD	25	3.53	.26	.05

was tested at a significance threshold of  $p < 0.05$  (Table 2).

The statistical analysis revealed statistically significant differences between the two categories of diagnosis in terms of the satisfaction domain, for the satisfaction with self  $t(48) = -2.58$   $p < 0.05$ . There was no statistically significant difference for the satisfaction with health,  $t(38.35) = -1.45$   $p > 0.05$  (Table 3).

The  $t$  test for independent samples revealed statistically significant differences

between the two categories of diagnosis in terms of the comfort domain, for the restricted activity,  $t(32.21) = 2.19$   $p < 0.05$ . There were no statistically significant differences for the physical comfort,  $t(48) = 1.60$   $p > 0.05$  and emotional comfort,  $t(45.16) = 1.04$   $p > 0.05$  (Table 4).

The  $t$  test for independent samples revealed statistically significant differences between the two categories of diagnosis in terms of the resilience domain, for the family

**Table 4. Means and standard deviations for resilience subscale in the studied groups**

	lot	N	Mean	Std. Deviation	Std. Error Mean
<b>Family Involvement</b>	ADHD	25	3.43	.63	.12
	ASD	25	4.14	.52	.10
<b>Social Problem Solving</b>	ADHD	25	3.27	.47	.09
	ASD	25	2.90	.80	.16
<b>Physical Activity</b>	ADHD	25	3.61	.29	.05
	ASD	25	3.50	.45	.09
<b>RESILIENCE DOMAIN</b>	ADHD	25	3.44	.40	.08
	ASD	25	3.61	.27	.05

**Table 5. Means and standard deviations for risk avoidance subscale in the studied groups**

	lot	N	Mean	Std. Deviation	Std. Error Mean
<b>Individual Risk Avoidance</b>	ADHD	25	3.67	.60	.12
	ASD	25	3.36	.81	.16
<b>Threats to Achievement</b>	ADHD	25	3.84	.57	.11
	ASD	25	3.70	.65	.13
<b>RISK AVOIDANCE DOMAIN</b>	ADHD	25	3.79	.51	.10
	ASD	25	3.60	.63	.12

**Table 6. Means and standard deviations for achievement subscale in the studied groups**

	lot	N	Mean	Std. Deviation	Std. Error Mean
<b>Academic Performance</b>	ADHD	25	2.39	.55	.11
	ASD	25	2.04	.71	.14
<b>Peer Relations</b>	ADHD	25	3.07	.54	.10
	ASD	25	2.64	.78	.15
<b>ACHIEVEMENT DOMAIN</b>	ADHD	25	2.73	.50	.10
	ASD	25	2.34	.47	.09

involvement,  $t(48) = -4.29$   $p < 0.01$ . There were no statistically significant differences for social problem solving,  $t(39.24) = 1.97$   $p > 0.05$  and physical activity,  $t(40.78) = 1.04$   $p > 0.05$  (Table 5).

The  $t$  test for independent samples revealed no statistically significant differences between the two categories of diagnosis in terms of the risk avoidance domain, for the individual risk avoidance,  $t(48) = 1.53$   $p > 0.05$  and threats to achievement,  $t(48) = 0.8$   $p > 0.05$  (Table 6).

The  $t$  test for independent samples revealed statistically significant differences between the two categories of diagnosis in terms of the achievement domain, for the peer relations,  $t(42.80) = 2.25$   $p < 0.05$ . There were no statistically significant differences for academic performance,  $t(45.35) = 1.94$   $p > 0.05$ .

## 4. DISCUSSIONS

### 4.1. Main findings

The statistical analysis revealed statistically significant differences between the two

categories of diagnosis in terms of the following dimensions of quality of life: health status and self-esteem, comfort - physical and emotional symptoms, activities limitation due to the illness, achievements - academic performance, relationships with peers. The quality-of-life dimensions for which the difference was of no statistical significance were resilience - family support, child's coping skills, child's physical activity level, risk avoidance - assessment of child risk behaviours.

Means and the standard deviations calculated for each CHIP-CE subscale (health status, comfort, resilience, risk, achievements) for ADHD and ASD groups, showed lower scores for ASD group for the domains comfort, risk avoidance and achievements, and higher scores than those for ADHD group for the domain satisfaction and resilience. For all the domains, the scores of ASD and ADHD groups were lower than those from the general population. Statistically significant differences between the two categories of diagnosis were registered for the domains: satisfaction, comfort, and achievements. The ADHD group had significantly higher scores

for the domains comfort and achievements, situation that can be explained by the fact that for ADHD there are more therapeutic options including medication that can improve children life and functionality. Surprisingly, ASD group scored significantly higher in the satisfaction domain, situation that can be explained maybe through parents' expectation regarding the child. ASD is considered a severe disorder, affecting child performance and individual functioning, but ADHD is still considered by many parents a behavioral or educational problem. For a better understanding, each domain was evaluated separately, between the two groups. The satisfaction domain is composed by 2 categories of items: satisfaction with health and satisfaction with self. The statistical analysis revealed statistically significant differences between the two categories of diagnosis in terms of the satisfaction domain, for the satisfaction with self. There was no statistically significant difference for the satisfaction with health.

These results showed that the significant difference between ASD and ADHD registered for satisfaction domain is due to the category satisfaction with self. Keeping in mind that CHIP-CE parent form evaluate the QoL of the child as considered by his parents, this situation can be explained also by parents' difficulties in rating how really satisfied with self is their autistic child (considering the communication difficulties and recognizing, naming emotional problems that are specific to autism). This and the lower need to socialize, specific for autism, may explain why the parents of children with ASD scored higher than those of children with ADHD on this domain. The comfort domain is composed by 3 categories of items: physical comfort, emotional comfort, and restricted activity. The t test for independent samples revealed statistically significant differences between the two categories of diagnosis in terms of

the comfort domain, only for the restricted activity category. In these conditions we may consider that in terms of physical and emotional comfort, there were no significant differences between ASD and ADHD groups. The category accounted for the significant difference between the two diagnoses is the restricted activity category. This result is in concordance with data from other studies that founded children diagnosed with ASD, compared to subjects with ADHD, participating less in social or recreational activities with their family. The resilience domain includes 3 categories of items: family involvement, social problem solving and physical activity. The t test for independent samples revealed statistically significant differences between the two categories of diagnosis only for the family involvement category. The families of children with ASD are significantly more involved in the life of the child, as rated on CHIP-CE, than those of children with ADHD.

This situation may be explained by the higher level of dependence of the children with ASD on their families. The risk avoidance domain is composed by 2 categories: individual risk avoidance and threats to achievement. The t test for independent samples revealed no statistically significant differences between the two categories of diagnosis for the individual risk avoidance, and threats to achievement. The achievement domain consists of 2 categories of items: peer relations and academic performance. The t test for independent samples revealed statistically significant differences between the two categories of diagnosis for the peer relations. The children with ADHD had higher scores in this domain, situation that can be explained by the socialization difficulties that are specific for ASD.

#### **4.2. Study limits**

The limits of this study were related to the fact that the CHIP-CE was filled in

by caregivers, indicating a possible loss in reporting accuracy, and a possible data bias. Also, the questionnaire was completed only by one parent (mother or father), mainly reflecting its perception on the child quality of life. The cross-sectional nature of the study reflects the quality of life for children diagnosed with ASD and ADHD at some point in time, so future longitudinal studies are needed to observe changes that occur depending on developmental stage.

## 5. CONCLUSIONS

Means and the standard deviations calculated for each CHIP-CE subscale (health status, comfort, resilience, risk, achievements) for ADHD and ASD groups, showed lower scores for ASD group for the domains comfort, risk avoidance and achievements, and higher scores than those for ADHD group for the domain satisfaction and resilience. For all the domains, the scores of ASD and ADHD groups were lower than those from the general population. Statistically significant differences between the two categories of diagnosis (ASD and ADHD) were registered for the domains: satisfaction, comfort, and achievements. The ADHD group had significantly higher scores for the domains comfort and achievements. ASD group scored significantly higher in the satisfaction domain. The significant difference between ASD and ADHD registered for satisfaction domain is due to the category satisfaction with self. The category accounted for the significant difference between the two diagnoses in the comfort domain, is the restricted activity category. The families of children with ASD are significantly more involved in the life of their child, as rated on CHIP-CE than those of children with ADHD. The category accounted for the significant difference between the two diagnoses in the achievement domain, is the peer relations category, in which the children with ADHD had higher scores. The

areas evaluated by the Child Health and Illness Profile (CHIP-CE/CRF) can provide information on the impact of developmental disorders, which are not evident through the assessment of symptoms. By understanding how the quality of life is affected by these disorders, the needs of children with TSA or ADHD will be better recognized, and the necessary therapy and support services will be developed accordingly.

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