

# Health-related quality of life in adults with attention-deficit and hyperactivity disorder

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**OBJECTIVE:** Attention-Deficit and Hyperactivity Disorder is a neurodevelopmental condition that causes substantial deficits in several aspects of human function, resulting in a poor quality of life. However, studies using valid reports to objectively document Quality of Life impairment in never-treated adults with Hyperactivity Disorder Self-Report Scale have, to date, been scarce. The aim of this study was to assess Quality of Life in a clinical sample of treatment-naïve adults with Attention-Deficit and Hyperactivity Disorder in comparison to a healthy control group, and to investigate the relationship between Quality of Life and symptom severity ratings.

**METHOD:** Symptom severity ratings (assessed using the Attention-Deficit and Hyperactivity Disorder Self-Report Scale) and quality of life measurements using the World Health Organization Quality of Life scale (through WHOQOL-BREF) were obtained from a sample of 46 treatment-naïve adults with Attention-Deficit and Hyperactivity Disorder (mean age=29.3 years) and a group of 28 healthy controls (mean age=28.7 years).

**RESULTS:** Quality of Life was significantly worse in the Attention-deficit and Hyperactivity Disorder group compared to the healthy controls. The severity of symptoms of hyperactivity (but not of inattention) was negatively correlated with quality of life.

**CONCLUSION:** The use of a generic Quality of Life tool such as the WHOQOL-BREF allows the detection of lower Quality of Life, vs. healthy controls, in adult Attention-Deficit and Hyperactivity Disorder patients, and highlights the relevance of Quality of Life impairment when planning and monitoring treatment strategies for such a population.

**KEYWORDS:** Attention-deficit and hyperactivity disorder; Adult; Treatment-naïve; Quality of life.

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## INTRODUCTION

Attention-deficit and hyperactivity disorder (ADHD) is a frequent and under diagnosed mental disorder in the general adult population, with a reported prevalence of up to 5.8%.<sup>1-4</sup> Symptoms are related to inattention, hyperactivity and impulsivity. Current standardized criteria prescribe that functional impairment must be present.<sup>5</sup> ADHD has been conceptualized as a neurodevelopmental disorder that affects several aspects of an individual's life, leading to academic, social, and interpersonal impairments. It contributes to changes of jobs, marital problems, and psychological distress.<sup>6-8</sup> Ignoring functional impairment in ADHD can lead to false-negative diagnoses.<sup>9</sup>

In psychiatric treatment, the interest in assessing quality of life (QoL) has arisen out of a concern that it is important to value parameters broader than simple symptom control as outcome variables.<sup>10-11</sup>

There is a growing interest in assessing QoL in ADHD patients, despite the relatively modest number of studies investigating this issue in adult ADHD samples.<sup>11</sup> Treatment with stimulant medication, the most effective pharmacologic treatment for ADHD,<sup>12-13</sup> has been associated with a significant improvement in the QoL of ADHD individuals.<sup>14</sup> It has also been suggested that, despite their overlap, symptom reduction and functional improvement should be seen as separable dimensions in ADHD.<sup>9</sup>

The aim of this study is to evaluate QoL among treatment-naïve adults with ADHD in comparison to a group of healthy controls. A generic QoL instrument, namely the World Health Organization Quality of Life Assessment, Brief Version - WHOQOL-BREF<sup>15</sup> was chosen because generic measures are considered more appropriate to investigate QoL across different categories of psychiatric disorders.

## METHODS AND MATERIALS

This investigation is part of a larger case-control research program using magnetic resonance imaging (MRI),

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neurocognitive testing, genetic and clinical investigation in adult ADHD patients in the city of São Paulo, Brazil.

### Participants

Treatment-naïve ADHD patients, aged 18-50 years were consecutively evaluated at the outpatient ADHD clinic of the Institute of Psychiatry, University of São Paulo, Brazil. Subjects were interviewed with the Structured Clinical Interview (SCID) for the Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> ed. (DSM-IV),<sup>5</sup> and the Schedule for Affective Disorders and Schizophrenia for school-age children - present and lifetime version - K-SADS-PL,<sup>16</sup> Adapted Module (version 6.0), in order to confirm the diagnosis of ADHD and to access potential AXIS-I comorbidities. For the assessment of symptom severity, we used the Adult ADHD Self-Report Scale - ASRS-18.<sup>17</sup>

The healthy control (HC) group included volunteers matched for gender and age with ADHD patients, recruited through advertisement in the local community. All subjects in the HC group also underwent clinical interviewing, including the SCID and the K-SADS-PL<sup>16</sup> screening, in order to exclude psychiatric disorders and previous use of psychopharmacological agents.

Exclusion criteria for both groups were: (a) substance abuse or dependence (current and lifetime); (b) the presence of medical or neurological disorders that could affect the central nervous system; (c) a history of mental retardation as assessed by clinical interviews with the patients and a close relative if necessary; (d) past history of head trauma with loss of consciousness; (e) contraindications for MRI scanning.

In addition to the clinical instruments mentioned above, both patients and HC were screened for substance use with the Alcohol Use Disorders Identification Test AUDIT<sup>18</sup> and the South Westminster Questionnaire.<sup>19</sup> Diagnostic criteria for substance abuse or dependence were assessed using the the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID).<sup>20</sup> Moreover, a general medical history, including information about cerebrovascular risk factors, and data on the use of psychotropic and general medications, was obtained through interviews with patients and/or their families.

The WHOQoL-BREF<sup>15</sup> was used to assess QoL. This generic scale contains 26 items grouped into four domains (physical, psychological, social relations, environment). Higher scores indicate better QoL.

This study was approved by the Institutional Ethics Committee. After complete description of the study to the subjects, written informed consent was obtained.

### Statistical analysis

Statistical differences between the two study groups on continuous variables were investigated with the Student's t-test, using the software package SPSS version 19. Each dimension of interest was tested separately as a dependent variable in the analyses. Correlations between QoL and symptom severity indices were calculated using the Pearson coefficient. The two-sided alpha level of 0.05 was used for significance inference.

### RESULTS

The sample with ADHD (n=46) had a mean age of 29.3 years (range: 18 to 50 years, Std. Dev. = 7.94), and there were twenty female subjects (43%). The HC group (n=26) had a mean age of 28.7 years (range 17 to 42 years, Std. Dev. = 6.82). Twelve were females (43%). The ADHD and HC groups did not differ significantly either in regard to age (t-test, p=0.75) or gender (chi-square test, p= 0.95).

Total QoL scores equaled 49.78 ± 10.73 in the ADHD group and 92.89 ± 32.97 in the HC group (p<0.001). In all domains investigated, there was a statistically significant difference between the ADHD vs. HC groups, with lower QoL ratings in the ADHD group, as shown in Table 1. Within the ADHD group, there were no statistically significant differences between females and males in regard to QoL scores (p = 0.36).

Correlation analyses showed that higher scores (above 24) in part-B of the ASRS scale (hyperactivity domain) were significantly correlated with lower QoL scores as shown in Table 2. There were no significant correlations between QoL scores and ratings in part-A of the ASRS scale (inattention domain).

### DISCUSSION

This study shows that adults with ADHD have poorer QoL as detected by the WHOQoL-BREF.<sup>15</sup> The WHOQoL Group-1995<sup>21</sup> has defined QoL as the self-perception and role of a human being towards culture, personal values, aims, expectations and concerns. The WHOQoL-BREF<sup>15</sup> is a health-related QoL instrument evaluating disease and treatment-related aspects of an individual, such as mood, motor limitations, and disposition. It is considered to be an adequate tool to compare different diseases, or individuals affected by one disease against HC.<sup>22</sup>

There are several other instruments that have been devised to assess QoL, but it is beyond the scope of this

**Table 1** - Comparison of quality of life measures between ADHD patients and healthy controls (Independent Samples t-Test)

Measures of QOL	Diagnosis	N	Mean	Std. Deviation	t-test value	Sig (2-tailed)
Physical	HC	28	83.04	11.81	9.12	< 0.001
	ADHD	46	54.50	13.75		
Psychological	HC	28	76.79	10.84	10.67	< 0.001
	ADHD	46	45.25	13.15		
Social relations	HC	28	78.57	13.11	5.73	< 0.001
	ADHD	46	54.89	19.29		
Environment	HC	28	58.93	10.44	4.30	< 0.001
	ADHD	46	47.35	11.67		
Total WHOQOL- BREF score	HC	28	72.86	7.99	9.65	< 0.001
	ADHD	46	50.11	10.79		

HC: Healthy control group, ADHD: Attention deficit Hyperactivity Disorder, N: Number of subjects, Std: standard, QOL: quality of life.

**Table 2 - Correlations between quality of life measures and symptom severity scores in the ADHD group**

		Physical	Psychological	Social relations	Environment	Total WHOQOL-BREF scores
ASRS-A	Correlation Coefficient	-0.046	-0.156	-0.105	0.047	-0.080
	N	46	46	46	46	46
ASRS-B	Correlation Coefficient	-0.270	-0.265	-0.309*	-0.148	-0.306*
	N	46	46	46	46	46

ASRS-A: Adult ADHD Self-Report Scale (part A). ASRS-B: Adult ADHD Self-Report Scale (part B), sig: significance. N: number of subjects. Correlation is significant at the 0.05 level (2-tailed) \*.

study to defend or discuss the virtues and limitations of the WHOQoL-BREF<sup>15</sup> as compared to such other scales.

The present results suggest that the WHOQoL-BREF<sup>15</sup> is an adequate instrument because it was able to detect differences between the ADHD and HC groups, with highly significant lower QoL values in the ADHD group. All QoL domains showed differences between the two groups. Previous studies reported a significant impact of ADHD on the QoL of individuals in multiple dimensions – social, psychological, surroundings, and relationships. Our findings are in agreement with such studies, confirming a multidimensional functional impairment linked to the diagnosis of ADHD.<sup>23-26</sup>

There were no significant differences between genders in regard to QoL ratings in the ADHD group, suggesting that the presence of ADHD itself causes poorer QoL regardless of gender. This corroborates the results of Rasmusen et al.<sup>27</sup> who observed important functional impairment caused by ADHD in adults, a finding that was unaffected by gender. Research on gender influences suggests differences in the expression of the disorder, with female ADHD patients displaying fewer hyperactivity/impulsivity symptoms than men, while the impact on QoL was found to be the same in both genders.<sup>28</sup>

The correlational analyses revealed that QoL correlated with the ASRS subscale assessing the severity of hyperactivity/impulsivity symptoms. To our knowledge, the relationship between symptom subscores for adult ADHD and different domains of the WHOQOL-BREF has not been previously established. However, Gjervan et al.<sup>26</sup> evaluated QoL in adult ADHD patients using a different health-related QoL instrument (the Short Form Health Survey: SF-36) and observed that hyperactivity/impulsivity symptoms were predictors of lower levels of social functioning and mental health. Szuromi et al.<sup>8</sup> also observed a significant relationship between impulsivity symptoms and a greater degree of functional impairment in ADHD patients. Although requiring further investigation, our findings support the view that hyperactivity/impulsivity symptoms are more pervasive in social environments, leading to more functional impairment, and, therefore, impacting on lower QoL ratings in ADHD sufferers.

Our study has at least two methodological limitations that should be acknowledged. Rather than being a population-based sample, our ADHD group was a clinical sample composed of individuals seeking treatment in a tertiary hospital. Thus, our sample possibly represents ADHD individuals with greater recognition of functional impairment, given the fact that they spontaneously looked for treatment. Therefore, our sample may not be representative of ADHD in the general adult population. Secondly, our sample was relatively small, and this prevented us from

stratifying QoL measures by the presence of comorbidities. The size of the sample may have also left us with insufficient statistical power to uncover gender differences. On the other hand, one important strength of our study was the recruitment of adult patients with ADHD who had never been exposed to any form of treatment for this disorder.

In conclusion, the use of a generic QoL tool such as the WHOQoL-BREF was relevant to show a lower QoL in never-treated adult ADHD patients compared to HC, with hyperactivity/impulsivity symptoms being significantly correlated with lower QoL. These findings indicate that the QoL parameter has important implications regarding impairment caused by ADHD. Greater awareness about QoL, and recognition of how this is affected in adult ADHD individuals can help to promote a change in the approach to the care of those patients, thus improving adherence and persistence of patients with their treatment.<sup>29</sup> We plan to focus specifically on this aspect in our future studies.

## SUMMARY

The use of a generic QoL scale (the WHOQOL-BREF) was relevant to show lower levels of QoL in treatment-naïve adults with ADHD compared to HC. Hyperactivity/impulsivity symptoms correlated with less QoL in ADHD patients.

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## RESUMO

**OBJETIVO:** O Transtorno de déficit de atenção e hiperatividade (TDAH) é um transtorno do neurodesenvolvimento que causa importantes prejuízos em várias áreas do funcionamento humano, resultando em pior qualidade de vida (QoL). Entretanto, são escassos os estudos que se utilizam de escalas válidas para documentar, objetivamente, os prejuízos na QoL de adultos com TDAH nunca tratados. O presente estudo teve por objetivos avaliar QoL numa amostra clínica de adultos com TDAH virgens de tratamento comparando com grupo controle saudável (GC) e investigar a relação entre QoL e gravidade de sintomas.

**MÉTODO:** Foram utilizadas para classificação de gravidade de sintomas a escala Auto-relato de sintomas TDAH em adultos, ASRS e como medida de QoL a WHOQOL-BREF em uma amostra de 46 adultos com TDAH com média de idade de 29,3 anos, que nunca receberam tratamento; estes foram comparados com 28 voluntários saudáveis – GC, com média de idade de 28,7 anos.

**RESULTADOS:** Observou-se QoL significativamente pior no grupo TDAH comparado ao GC ( $p < 0,001$ ). A gravidade de sintomas de hiperatividade (mas não os de desatenção) correlacionou negativamente com escores da escala de QoL ( $p < 0,05$ ).

**CONCLUSÃO:** O uso de um instrumento genérico de QoL como a WHOQOL-BREF, permite a detecção de baixa QoL em adultos com TDAH comparado ao GC e destaca a importância que deve ser atribuída a prejuízos na QoL durante o planejamento e monitoramento de estratégias de tratamento para esta população.

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