
MESTRADO INTEGRADO EM MEDICINA – TRABALHO FINAL

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# *AUTISTIC-LIKE TRAITS IN ADHD: A PATHWAY TO PSYCHOLOGICAL DISTRESS*

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Trabalho realizado sob a orientação de:

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# Autistic-like traits in ADHD: a pathway to psychological distress

# Traços do tipo autista na PHDA: uma via para a perturbação psicológica

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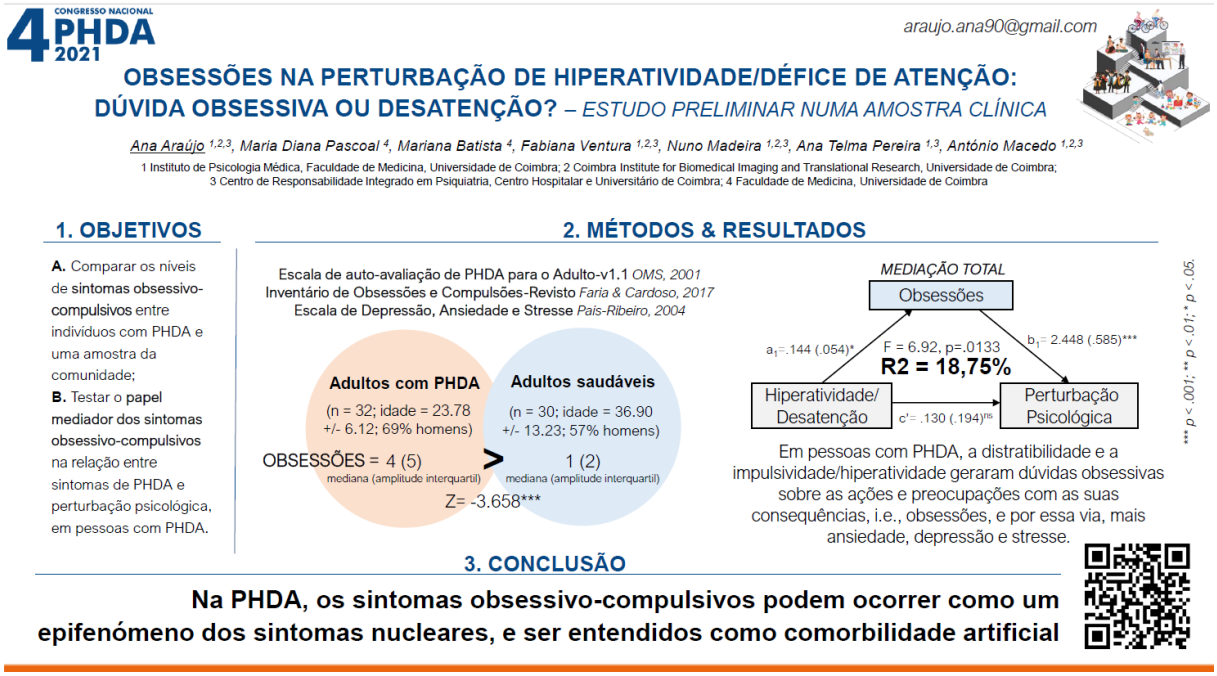
This study was part of a research project, and our data were presented in a poster presentation format in the SPDA (*Sociedade Portuguesa de Défice de Atenção* – Portuguese Society of Attention Deficit) which won the best poster award.



4 CONGRESSO NACIONAL PHDA 2021

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**OBSESSÕES NA PERTURBAÇÃO DE HIPERATIVIDADE/DÉFICE DE ATENÇÃO: DÚVIDA OBSESSIVA OU DESATENÇÃO? – *ESTUDO PRELIMINAR NUMA AMOSTRA CLÍNICA***

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**1. OBJETIVOS**

**A.** Comparar os níveis de **sintomas obsessivo-compulsivos** entre indivíduos com PHDA e uma amostra da comunidade;

**B.** Testar o **papel mediador dos sintomas obsessivo-compulsivos** na relação entre sintomas de PHDA e perturbação psicológica, em pessoas com PHDA.

**2. MÉTODOS & RESULTADOS**

Escala de auto-avaliação de PHDA para o Adulto-v1.1 *OMS, 2001*
Inventário de Obsessões e Compulsões-Revisto *Faria & Cardoso, 2017*
Escala de Depressão, Ansiedade e Stresse *Pais-Ribeiro, 2004*

**Adultos com PHDA** (n = 32; idade = 23.78 +/- 6.12; 69% homens)

**Adultos saudáveis** (n = 30; idade = 36.90 +/- 13.23; 57% homens)

OBSESSÕES = 4 (5) mediana (amplitude interquartil) > 1 (2) mediana (amplitude interquartil)

Z= -3.658***

*MEDIAÇÃO TOTAL*

Obsessões

$a_1$=.144 (.054)*

F = 6.92, p=.0133

**R2 = 18,75%**

$b_1$= 2.448 (.585)***

Hiperatividade/ Desatenção

$c'$= .130 (.194)$^{ns}$

Perturbação Psicológica

***p < .001; ** p < .01; * p < .05.

Em pessoas com PHDA, a distratibilidade e a impulsividade/hiperatividade geraram dúvidas obsessivas sobre as ações e preocupações com as suas consequências, i.e., obsessões, e por essa via, mais ansiedade, depressão e stresse.

**3. CONCLUSÃO**

**Na PHDA, os sintomas obsessivo-compulsivos podem ocorrer como um epifenómeno dos sintomas nucleares, e ser entendidos como comorbilidade artificial**

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## CERTIFICADO

**Ana Araújo, Maria Diana Pascoal, Mariana Batista, Fabiana Ventura, Nuno Madeira, Ana Telma Pereira** e **António Macedo** participaram no 4.º Congresso Nacional PHDA 2021, que se realizou, em formato online, a 21 e 22 de outubro, com a apresentação da comunicação intitulada de **Obsessões na PHDA: dúvida obsessiva ou desatenção? – estudo preliminar numa amostra clínica**, tendo obtido o **Prémio da Melhor Comunicação Póster**.

Coimbra, 22 de outubro de 2021
A Comissão Organizadora

(José Eduardo Lopes Boavida Fernandes)
Presidente e Membro do Conselho de Fundadores da SPDA - Sociedade Portuguesa de Défice de Atenção

Organização: SPDA

Patrocínio Científico: SPP Sociedade Portuguesa de Pediatria; APP

Com o apoio de: Bial Keeping life in mind.; AZEVEDOS

Our work was also accepted for publication and e-poster viewing in the 30th European Congress of Psychiatry (EPA 2022) Virtual Congress.


## Eating problems in ADHD: self-regulatory or inattentive/impulsive

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**Introduction:** ADHD is a risk factor for impulsive/compulsive eating problems (EP). In, bulimia nervosa and compulsive eating disorder, EP are frequently preceded by negative affect and experienced as loss of control. Clarifying the underlying causes (e.g., ADHD symptoms and/or psychological distress) of EP in ADHD would allow the development of targeted interventions.

**Objective:** To a) compare levels of EP between ADHD patients and a community sample, and b) test if ADHD symptoms and psychological distress predict EP, in ADHD patients.
Methods: Adults with ADHD (n=32; age=23.78+/-6.12; 69% males) from the Neurodevelopmental Outpatient Unit of Coimbra and healthy participants (n=30; age=36.90+/-13.23; 57% males) answered an online survey including the Portuguese versions of the Adult ADHD Self-Report Scale Symptom Checklist, the Parkinson's Disease Impulsive-Compulsive Disorders Questionnaire-Current Short and the Depression, Anxiety and Stress Scale.

**Results:** The ADHD group reported experiencing more EP than healthy individuals (18/32 vs. 4/30; $\chi 2=12.458$, $p<.001$). ADHD patients with EP suffered from more severe ADHD inattentive, hyperactive, and global symptoms and higher levels of psychological distress

(p<.001 to p=.027). Logistic regression model testing if ADHD and psychological distress symptoms predicted EP, in ADHD, explained 38.8% of the variance and showed that the only significant predictor was ADHD symptoms (B=.121, SE=.051, p=.017).

**Conclusions:** Our results indicate that EP are associated with more severe ADHD clinical pictures. EP arose secondarily to ADHD symptoms, instead of serving as means to alleviate psychological distress. Clinicians should be mindful that, in ADHD patients, EP follow specific motivations, i.e., impulsivity and inattention, and may respond to combined cognitive-behavioural/executive training strategy.

More, during my internship in Family Medicine, I was asked to do a presentation about ADHD in adults (to help alert Family Medicine doctors to this diagnosis) where I shared some of the preliminary results found in this study and the project in which it is involved.

## Index

## 1. List of abbreviations

| | |
|---|---|
| ADHD | Attention Deficit/ Hyperactivity Disorder |
| ASD | Autism Spectrum Disorder |
| AT | Autistic Traits |
| ASRS-V1.1 | The Adult ADHD Self-Report Screening Scale – version 1.1 |
| AQ | Autism Spectrum Quotient |
| DASS-21 | Depression Anxiety Stress Scale |
| CHUC | Centro Hospitalar Universitário de Coimbra |
| IQ | Intelligence Quotient |
| DSM-5 | The Diagnostic and Statistical Manual of Mental Disorders 5$^{th}$ edition |
| DMS-IV-TR | Diagnostic and Statistical Manual of Mental Disorders, 4$^{th}$ edition, text revision |
| ADHD_A | Inattentive symptom dimension of ADHD |
| ADHD_H | Hyperactive symptom dimension of ADHD |
| ADHD_T | Total ADHD symptoms |
| IMG | Imagination dimension of AQ |
| COM | Communication dimension of AQ |
| AT_DET | Attention to detail dimension of AQ |
| SOCIAL_B | Social Behaviour dimension of AQ |
| TOTAL AQ | Total Autism Quotient |
| STRESS | Stress dimension of DASS-21 |
| DEP | Depression dimension of DASS-21 |
| ANX | Anxiety dimension of DASS-21 |
| TOTAL DASS-21 | Total Psychological Distress |

## 2. List of Tables



## 3. List of Figures

## 4. Abstract

**Introduction:** Attention-Deficit/Hyperactivity Disorder (ADHD) and Autism Spectrum Disorder are neurodevelopment disorders with overlapping features and high comorbidity rates with each other. Only recently, it was recognized that ADHD persists into adulthood. These scenarios challenge precise diagnosis and treatment and may lead to psychological distress.

**Objectives:** To compare the frequency of autistic traits (AT) between ADHD and healthy control samples. To explore the correlation between ADHD dimensions, AT and psychological distress. To test if AT mediates the relationship between ADHD dimensions and psychological distress

**Methods:** 32 ADHD patients and 37 heathy controls filled an online survey with the Portuguese validated versions of the Adult ADHD Self-Report Screening Scale – version 1.1; Autism Spectrum Quotient and Depression Anxiety Stress Scale to measure ADHD dimensions, AT, and psychological stress dimensions, respectively. Descriptive, correlational, and mediation analysis were performed using SPSS 26 and PROCESS v3.5.

**Results:** The ADHD group reported significantly more AT *($p = .010$)*, namely communication ($p = .013$) and attentional switch ($p = .015$) deficits. In the ADHD sample, ADHD dimensions correlated with psychological distress ($p = .023$) and communication deficits ($p < .001$). Communication deficits also correlated with psychological distress ($p = .002$) and fully mediated the relation between inattentive dimension and psychological distress.

**Discussion and conclusion:** ADHD patients perceive themselves as having difficulties in communicating with peers. Further, communication deficits were a necessary condition for inattentive symptoms to generate psychological distress. Thus, the occurrence of communication difficulties is particularly deleterious in the inattentive presentation of ADHD. Clinical intervention targeting communication difficulties in ADHD patients should account for the negative impact of distractibility on communication.

**Keywords:** Attention-Deficit/Hyperactivity-Disorder, autistic traits, psychological distress

## 5. Resumo

**Introdução:** A perturbação de hiperatividade/défice de atenção (PHDA) e a perturbação do espetro do autismo são doenças do neurodesenvolvimento que partilham vulnerabilidades de ordem genética, neurobiológica e psicológica, verificando-se uma elevada comorbilidade entre ambas. Apenas recentemente, a PHDA tem sido reconhecida como uma perturbação que se pode estender até à idade adulta. Estes fatores causam desafios diagnósticos importantes.

**Objetivos:** Comparar a frequência de traços autistas (TA) entre um grupo de doentes com PHDA e um grupo controlo. Explorar a correlação entre as dimensões de PHDA, TA e a perturbação psicológica. Testar se os TA medeiam a relação entre dimensões de PHDA e a perturbação psicológica.

**Métodos:** 32 doentes com PHDA e 37 controlos saudáveis preencheram um protocolo online que incluiu as versões portuguesas validadas da Escala de Autoavaliação de PHDA para o Adulto, Quociente do Espetro de Autismo e Escala de Ansiedade, Depressão e Stresse. A análise descritiva, correlacional e mediacional foi realizada no SPSS 26 e PROCESS v3.5.

**Resultados:** Comparativamente com o grupo de indivíduos saudáveis, o grupo de doentes com PHDA reportou mais TA ($p = .010$), nomeadamente défices na comunicação ($p = .013$) e no switch atencional ($p = .015$). As dimensões da PHDA correlacionaram-se com elevados níveis de perturbação psicológica ($p = .023$) e défices de comunicação dos TA ($p < .001$). Os défices de comunicação correlacionaram-se com a perturbação psicológica ($p = .002$) e mediaram totalmente a relação entre a dimensão de inatenção da PHDA e a perturbação psicológica.

**Discussão e conclusão:** Indivíduos com PHDA percecionam ter mais dificuldades na comunicação com os pares. Nos doentes com PHDA, apenas quando a desatenção gerou dificuldades de comunicação significativas, esta relação provocou perturbação psicológica. Portanto, a ocorrência de défices na comunicação parece ser particularmente deletéria quando ocorre na apresentação desatenta. As intervenções clínicas do tipo treino de competências sociais podem ser úteis na PHDA e devem considerar o impacto negativo da distratibilidade na comunicação.

**Palavras-chave:** Perturbação de hiperatividade e défice de atenção, traços autistas perturbação psicológica.

## 6. Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) and Autism Spectrum Disorder (ASD) are neurodevelopment disorders. This means that they are life-long conditions that manifest at an early age, even before children begin school. (1) Symptoms present a chronic course and may generate deficits of personal, social, academic, or occupational functioning (1) resulting in a very wide range of impairments.

ADHD is defined as a persistent pattern of inattention and/or hyperactivity-impulsivity, which is inconsistent with the individual's chronological age and interferes with functioning or development. (1) Based on predominant symptomology, ADHD has three presentation types: inattentive, hyperactive/impulsive or combined. (2)

In adulthood, inattention is associated with disorganization of life routines. Inattention may also hamper social communication due to difficulties in listening to others and remaining on the current task (e.g.: conversation). (1, 3) The dimension of hyperactivity/impulsivity characterized by overactive behaviours, difficulty in remaining still or seated, intruding into other people's activities or even the inability to wait. (1)

For decades ADHD was mainly viewed as childhood disorder. However, recent findings strongly support that ADHD symptoms persist into adulthood in 60% of patients. (4) Noteworthy, to meet the diagnosis criteria, adults need less inattentive/ hyperactive symptoms, because usually, these diminish with aging. (2, 5) The prevalence of adult ADHD has been estimated between 2.58% for persistent adult ADHD (with a childhood onset) and 6.76% for symptomatic adult ADHD (regardless of a childhood onset). (6)

Due to their rule-breaking behaviours, adults with ADHD have an increased risk of having legal problems at a younger age, including delinquency, criminality, and recidivism, which can all lead to imprisonment. (2, 7) Thereby, worldwide public health costs of untreated ADHD are significant, urging the prevention of its primary symptoms and comorbidities. (6, 8)

Research shows that ADHD in adults is very frequently comorbid with a large range of distinct psychiatric disorders, such as anxiety, depression, substance abuse, mood disorders, and others. In total, about 80% of adults with ADHD have at least one other disorder. (2, 8-10) These comorbidities seldomly have symptoms that can mimic those from ADHD, which added to adult ADHD being unrecognized, and may lead to misdiagnosis. (9) Understanding the pathways leading to comorbidity is necessary to correctly identify symptoms of adult ADHD.

In this study, we were interested in clarifying the relationship between ADHD and co-occurring AT.

ASD is characterized by deficits in social communication and interaction in multiple contexts. Impairments can be both verbal (delayed and abnormal language) and non-verbal (poor social reciprocity and social communication, difficulties in imaginative play, difficulty in

recognising and understanding emotions, repetitive behaviours, and unusual interests) – expressed by the difficulty in understanding and maintaining relationships. (1, 11) Patients also show restrictive, stereotyped, and ritualized patterns of behaviour and interests. (12-14)

ASD prevalence have been increasing over time. Currently, in Europe, it ranges between 0.38 and 1.55%. (15)

Most frequent comorbidity in ASD includes ADHD, anxiety and depressive disorders, epilepsy, intellectual disability, sleep disorders, sight/hearing impairment/loss, or gastro-intestinal syndromes, which add heterogeneity to the clinical presentation. (15)

ADHD and ASD have several risk factors in common, namely genetic (both possess a significant heritability), biologic, and psychosocial factors (10, 16). Furthermore, the presence of ADHD is a risk factor for the presence of ASD, and vice-versa. According to recent evidence, up to 30% of patients with ASD also have a diagnosis of ADHD. This corresponds to approximately six times the prevalence in children and adolescents worldwide. (17, 18) The reverse analysis shows similar results (19). When there is a double diagnosis the impairments in cognitive functioning and adaptive behaviour are more severe. Likewise, there is an increased likelihood to present more emotional/behavioural problems. (20)

In ADHD patients, autistic traits (AT) can be associated with greater morbidity and more severe psychopathology as well as higher impairment in interpersonal, school, family, and cognitive functioning. (21, 22) Autistic-like communication deficits and repetitive behaviours may occur in ADHD, as a true comorbidity (19, 23), as well as secondary to ADHD symptoms. Clarifying the process underlying autistic-like symptoms across ADHD patients is crucial to initiate the right treatment.

This study aimed at: a) comparing the frequency of AT between ADHD and healthy control samples; b) exploring the correlation between ADHD dimensions, AT and psychological distress; c) testing if AT mediates the relationship between ADHD dimensions and psychological distress

We hypothesized that subjects with ADHD would present high levels of AT and that, when present, these traits would contribute to psychological distress. Moreover, we expected that, at least in some patients, AT would be an epiphenomenon of the primary ADHD psychopathology.

## 7. Materials and Methods

The present work is an observational, correlational, transversal and exploratory study that is part of an ongoing research project approved by the Ethical Committees of the Faculty of Medicine, University of Coimbra (054-CE-2019) and the Coimbra Hospital and University Centre (CHUC).

### *7.1 Subjects and procedure*

All participants were recruited through social media, where they were asked to fill an online survey, including sociodemographic and clinical questions and three validated Portuguese versions of self-reported questionnaires to evaluate ADHD symptoms, AT, and psychological distress. All subjects were fluent in the Portuguese language. Participants voluntarily provided written informed consent to participate in this study.

Thirty-two ADHD patients were invited to participate in this study, during their medical follow-up at the Adult Neurodevelopmental Disorders Unit of the CHUC. Primary ADHD diagnosis was made accordingly to DSM-5 (The Diagnostic and Statistical Manual of Mental Disorders 5$^{th}$ edition) criteria, by a psychiatrist or a psychiatry resident with experience in neurodevelopmental disorders. Comorbidity with autism, obsessive-compulsive disorder, psychosis, substance dependence and mental deficiency was assessed according to DSM-5 criteria and was an exclusion criterion. Although none of the participants was evaluated for the IQ (Intelligence Quotient), all patients presented functional levels which were indicative normal intelligence.

All healthy controls (n=37) denied suffering from a psychiatric disorder(s) nor being on psychiatry follow-up.

### *7.2. Measures*

#### *7.2.1. Adult ADHD Self-Report Screening Scale – version 1.1 (24, 25)*

The Adult ADHD Self-Report Screening Scale – version 1.1 (ASRS – v1.1) is an 18-item self-assessment instrument to evaluate adult ADHD symptoms, according to DSM-4-TR (Diagnostic and Statistical Manual of Mental Disorders, 4$^{th}$ edition, text revision) in the last 6 months, in a 5-point Likert scale, from 0 (Never) to 4 (Very Often). As there is no validated cut-off for the portuguese population, in this study, we applied the instructions of the original version. (24) The original authors found a two-factor solution, named Part A and Part B (9 items each), evaluating inattentive and hyperactive/impulsive symptoms, respectively. Although they are not diagnostic per se, scores in the ASRS – v1.1 may indicate the need for

a more in-depth clinical evaluation. A score between 0 and 16 indicates unlikely ADHD; a score between 17 – 23 indicates likely ADHD; and a score 24 or more indicates highly likely ADHD.

#### *7.2.2. Autism Spectrum Quotient (26, 27)*

The Autism Spectrum Quotient (AQ) is a 50-item self-assessment instrument for measuring the degree to which any individual adult of normal IQ has traits associated with the autistic spectrum (26), across five domains: (poor) social skill, (poor) communication, (poor) attention-switching, (exceptional) attention to detail and (poor) imagination. The AQ has reasonable face and construct validity, excellent test-retest reliability, and does not appear to be influenced by IQ or by socioeconomic status. Although being insufficient for an ASD diagnosis, AQ scores of $\geq 32$ indicate the presence of significant AT. The dimensionality of AQ enables the assessment of ASD traits as continuous, rather than categorical or diagnostic variables (26), which was preferable in the present study as we intended to evaluate the broad autistic phenotype. In this study, we used the portuguese translation of São Luís Castro & César F. Lima. (27)

#### *7.2.3. Depression Anxiety Stress Scale (28, 29)*

The Depression Anxiety Stress Scale (DASS-21) is a 21-item self-report instrument widely used to measure psychological distress, namely negative emotional states of depression, anxiety, and stress among clinical and non-clinical populations, accordingly to the past week. Participants are asked to answer on a Likert scale from 0 (Did not apply to me at all) to 3 (Applied to me very much). (29) The DASS-21 Portuguese psychometric studies resulted in good parameters of reliability, construct, and concurrent validity, and its factorial structure overlap with the original. (28)

### *7.3. Statistical analysis*

Descriptive, Spearman correlation and Mann-Whitney U analyses were conducted using the software SPSS, version 26. $X^2$ analyses were used to examine the dichotomous variables. The exploratory serial mediation analysis was performed using PROCESS macro (Model 4) for SPSS. (30) The effects were estimated with 5000 bias-corrected bootstrap samples. The PROCESS macro uses the bootstrapping method, which is a method of assessing direct and indirect effects of variables in a way that maximizes power and is robust against non-normality. The indirect effect represents the impact of the mediator variable(s) on the original relation (i.e., the relation of the independent variable on the outcome variable). (30) According to the model being tested, ADHD dimensions were the independent variables,

autistic domains were inserted as mediators and total psychological distress was the dependent variable. The significance level was set at $p < 0.05$.

## 8. Results

### *8.1 Description of the sample*

**Table 1** – Demographic and clinical characteristics of the ADHD and control group

| | M (SD) / Md (IqR) ADHD sample (n=32) | M (SD) / Md (IqR) Control sample (n=37) | Mann-Whitney U test / Chi Square test |
|---|---|---|---|
| Female (%) | 31,25 | 51.35 | NS |
| Age | 23.78 (6.12) / 21.00 (8.00) | 26.59 (8.83) / 23.00 (13.00) | NS |
| ADHD_T | 39.81 (11.05) / 40.00 (18.50) | 28.24 (12.47) / 21.00 (20.50) | Z= -3.751; p< .001 |
| ADHD_A | 21.53 (6.09) / 21.50 (9.00) | 15.78 (6.51) / 14.00 (12.00) | Z= -3.401; p= .001 |
| ADHD_H | 18.28 (6.54) / 19.50 (11.50) | 12.46 (6.53) / 10.00 (11.50) | Z= -3.400; p= .001 |
| TOTAL AQ | 22.09 (5.09) / 22.00 (7.50) | 18.73 (5.52) / 19.00 / (7.50) | Z= -2.586; p= .010 |
| AT_SWITCH | 6.25 (2.06) / 7.00 (2.75) | 5.19 (1.79) / 5.00 (2.50) | Z= -2.434; p= .015 |
| AT_DET | 4.56 (2.14) / 4.50 (3.00) | 4.89 (1.98) / 5.00 (3.00) | NS |
| COM | 3.53 (1.93) / 3.00 (3.00) | 2.30 (2.03) / 2.00 (4.00) | Z= -2.477; p= .013 |
| SOCIAL_B | 3.22 (2.56) / 3.00 (4.00) | 2.59 (2.35) / 2.00 (3.00) | NS |
| IMG | 4.53 (1.72) / 5.00 (2.50) | 3.76 (2.05) / 3.00 (3.00) | NS |
| TOTAL DASS-21 | 19.69 (14.20) / 17.50 (20.50) | 14.32 (11.27) / 12.00 (15.50) | NS |
| ANX | 4.16 (4.45) / 2.00 (5.75) | 2.70 (2.93) / 2.00 (5.50) | NS |
| DEP | 7.34 (5.76) / 7.00 (8.50) | 5.54 (5.40) / 4.00 (6.00) | NS |
| STRESS | 8.19 (5.46) / 7.00 (7.50) | 6.08 (3.95) / 6.00 (5.00) | NS |

**Legend: M**, Mean; **SD**, Standard Deviation; **Md**, Median; **IqR**, Interquartile Range; **ADHD.** Attention-Deficit/ Hyperactivity Disorder; **NS**, Not significant; **ADHD.** Attention-Deficit/ Hyperactivity Disorder; **ADHD_T.** ADHD total symptoms; **ADHD_A.** ADHD Inattentive symptom dimension; **ADHD_H.** ADHD Hyperactive symptom dimension; **AQ.** Autism Spectrum Quotient; **TOTAL AQ.** Total Autism Spectrum Quotient; **AT_SWITCH.** Attentional switch dimension of AQ; **AT_DET.** Attention to detail dimension of AQ; **COM.** Communication dimension of AQ; **SOCIAL_B.** Social Behaviour dimension of AQ; **IMG.** Imagination dimension of AQ; **DASS-21.** Depression Anxiety Stress Scale**; TOTAL DASS-21.** Total Psychological Distress; **ANX.** Anxiety dimension of DASS-21; **DEP**. Depression dimension of DASS-21; **STRESS.** Stress dimension of DASS-21.

Table 1 shows that no statistically significant differences were observed in gender or age distribution between the ADHD and control samples. Regarding the ADHD sample, most of the participants were students (n= 15; 46.8%) and only three were unemployed. The educational level was secondary school for 17 (53.1%) participants, high education for 12 (37.5%) participants, and three participants finished the ninth grade of basic education. Most of the individuals from the ADHD sample were single (n= 28; 87.5%). Comorbidity with depression (n= 1), anxiety disorders (n= 2) and epilepsy (n= 1) were reported. The mean age at onset of ADHD symptoms was 12.26 years. The majority of the patients were on psychopharmacological medication for their ADHD (n= 26; 81.3%), namely different formulations of methylphenidate (n= 23; 71.9%) and lisdexamfetamine (n= 3; 9.4%).

#### *8.1.1. Differences in autism spectrum traits and psychological distress between the ADHD and control samples*

Compared with the control sample, ADHD patients presented significantly higher levels of total AT and its domains attention switch and communication deficits (from p= .015 to p= .010). Levels of psychological distress did not differ between samples.

### *8.2 Correlations between ADHD symptom dimensions, autism spectrum traits and psychological distress – ADHD sample*

**Table 2** – Spearman correlations between ADHD symptom dimensions and autism spectrum traits – ADHD sample

| | IMG | COM | AT_DET | AT_SWITCH | SOCIAL_B | TOTAL AQ |
|---|---|---|---|---|---|---|
| ADHD_A | NS | **ξ =** .468<br>p= .007 | NS | NS | NS | NS |
| ADHD_H | NS | **ξ =** .589<br>p < .001 | NS | NS | NS | NS |
| ADHD_T | NS | **ξ =** .585<br>p < .001 | NS | NS | NS | NS |

**Legend: ξ** Spearman (non-parametric) correlation; **NS**. Not significant; **ADHD_A.** ADHD Inattentive symptom dimension; **ADHD_H.** ADHD Hyperactive symptom dimension; **ADHD_T.** ADHD total symptoms; **AQ.** Autism Spectrum Quotient; **IMG.** Imagination dimension of AQ; **COM.** Communication dimension of AQ; **AT_DET.** Attention to detail dimension of AQ; **AT_SWITCH.** Attentional switch dimension of AQ; **SOCIAL_B.** Social Behaviour dimension of AQ; **TOTAL AQ.** Total Autism Spectrum Quotient.

Table 2 shows that, from the AT, only communication difficulties correlated with ADHD scores and its dimensions (from p= .007 to p < .001).

**Table 3** – Spearman correlations between ADHD symptom dimensions and psychological distress – ADHD sample

| | STRESS | DEP | ANX | TOTAL DASS-21 |
|---|---|---|---|---|
| ADHD_A | **ξ =** .433<br>p= .013 | NS | NS | **ξ =** .362<br>p= .042 |
| ADHD_H | **ξ =** .593<br>p < .001 | NS | .403<br>p= .022 | **ξ =** .468<br>p= .007 |
| ADHD_T | **ξ =** .514<br>p= .003 | NS | NS | **ξ =** .401<br>p= .023 |

**Legend: ξ** Spearman (non-parametric) correlation; NS Not significant; **ADHD.** Attention-Deficit/ Hyperactivity Disorder; **ADHD_A.** ADHD Inattentive symptom dimension; **ADHD_H.** ADHD hyperactive symptom dimension; **ADHD_T.** ADHD total symptoms; **DASS-21.** Depression Anxiety Stress Scale; **STRESS.** Stress dimension of DASS-21; **DEP**. Depression dimension of DASS-21; **ANX.** Anxiety dimension of DASS-21; **TOTAL DASS-21.** Total Psychological Distress.

Table 3 shows that psychological distress (total score and stress dimension) significantly correlated with total ADHD scores and its dimensions (from p= .042 to p= .007).

**Table 4** – Spearman correlations between autism spectrum traits and psychological distress – ADHD sample

| | STRESS | DEP | ANX | TOTAL DASS-21 |
|---|---|---|---|---|
| SOCIAL_B | NS | NS | NS | NS |
| AT_SWITCH | NS | NS | NS | NS |
| AT_DET | NS | NS | NS | NS |
| COM | **ξ =** .542<br>p= .001 | **ξ =** .419<br>p= .017 | **ξ =** .404<br>p= .022 | **ξ =** .534<br>p= .002 |
| IMG | NS | NS | NS | NS |
| TOTAL AQ | **ξ =** .382<br>p= .031 | NS | NS | **ξ =** .354<br>p= .047 |

**Legend: ξ** Spearman (non-parametric) correlation; **NS**. Not significant; **DASS-21.** Depression Anxiety Stress Scale**; STRESS.** Stress dimension of DASS-21; **DEP**. Depression dimension of DASS-21; **ANX.** Anxiety dimension of DASS-21; **TOTAL DASS-21.** Total Psychological Distress; **AQ.** Autism Spectrum Quotient; **SOCIAL_B.** Social Behaviour dimension of AQ; **AT_SWITCH.** Attentional Switch dimension of AQ; **AT_DET.** Attention to Detail dimension of AQ; **COM.** Communication dimension of AQ; **IMG.** Imagination dimension of AQ; **TOTAL AQ.** Total autism spectrum quotient.

Table 4 shows that autistic communication difficulties correlated with all psychological distress dimensions (from p=.022 to p= .001).

### *8.3. Serial multiple mediation analyses (Table 5)*

Informed by the results of our correlational analysis, three exploratory serial multiple mediation models were analysed to test the mediation roles of: a) autistic communication deficits (M) in the relationship between total ADHD symptoms (X) and psychological distress (Y); b) autistic communication deficits (M) in the relationship between hyperactive symptom dimension of ADHD (X) and psychological distress (Y); c) autistic communication deficits (M) in the relationship between inattentive ADHD symptom dimension (X) and psychological distress (Y).

Communication deficits were hypothesized to have an enhancing effect on ADHD symptoms leading to more psychological distress. Besides understanding the routes leading to psychological distress in ADHD, these models were performed to test our hypotheses that ADHD symptoms may cause communications deficits, and this relationship may account for more psychological distress, in ADHD patients.

**Table 5** – Exploratory serial multiple mediation analysis

| | | | | Bootstrapping 95% CI | |
|---|---|---|---|---|---|
| Effects | Coefficient | SE | p | Lower | Upper |
| **X: ADHD_T, Y: TOTAL DASS-21, M: COM** | | | | | |
| Total effect (c) | .4812 | .2875 | .0347 | .0370 | .9254 |
| Direct effect (c') | .2740 | .2697 | .3181 | - .2776 | .8255 |
| Indirect effect (a1b1) | .2072 | .1395 | - | - .0130 | .5287 |
| **X: ADHD_H, Y: TOTAL DASS-21, M: COM** | | | | | |
| Total effect (c) | .9995 | .3522 | .0081 | .2803 | 1,7187 |
| Direct effect (c') | .7540 | .4336 | .0926 | - .1328 | 1.6408 |
| Indirect effect (a1b1) | .2455 | .2178 | - | - .1461 | .7184 |
| **X: ADHD_A, Y: TOTAL DASS-21, M: COM** | | | | | |
| Total effect (c) | .4341 | .4186 | .3080 | -.4208 | 1.2890 |
| Direct effect (c') | .0011 | .4504 | .9980 | - .9200 | .9223 |
| Indirect effect (a1b1) | .4329 | .2429 | - | .0558 | .9850 |

**Legend: SE.** Standard Error; **CI.** Confidence Interval; **X.** Independent variable; **Y.** Dependent variable; **M.** Mediator; **ADHD.** Attention-Deficit/ Hyperactivity Disorder; **ADHD_T.** ADHD total symptoms; **ADHD_H.** ADHD hyperactive symptom dimension; **ADHD_A.** ADHD Inattentive symptom dimension; **TOTAL DASS-21.** Total Psychological Distress; **COM.** Communication dimension of Autism Spectrum Quotient.

***Note:*** Total, direct, and indirect effects of the serial mediation models with psychological distress as the outcome.

Table 5 presents the summary of the results of the serial mediation analysis, with an indication of the total (c), direct (c') and indirect (a1b1) effects that were estimated for all mediations.

The first model, presented in figure 1, explored the mediational role of autistic communication deficits on the relationship between total ADHD symptoms and psychological distress. Results indicated that the total effect of total ADHD symptoms on psychological distress was significant (Effect = .4812, Standard Error (SE) = .2875, p =.0347) but the direct effect was not. Hence, when controlling for the effect of communication deficits, the effect of ADHD symptoms on psychological distress became non-significant. Table 5 also shows that the indirect effect of total ADHD symptoms on psychological distress through communication deficits was non-significant (95% Confidence Interval (CI): - .0130 to .5287). The model explained 36.29% of psychological distress variance (F = 17,0850, p = .0003).

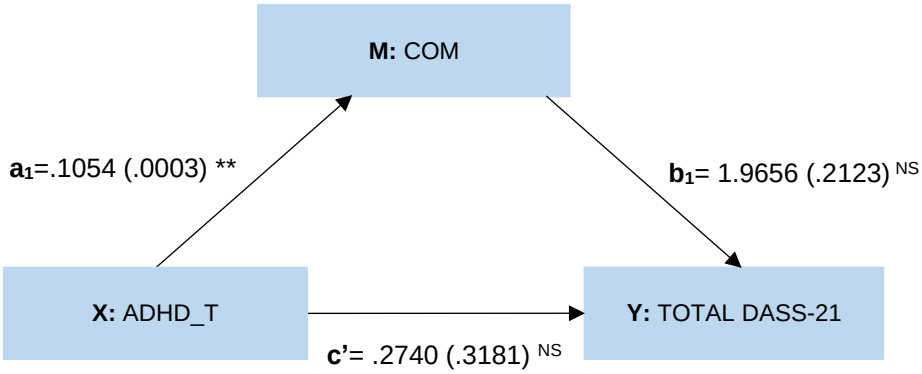


**Figure 1** – Serial multiple mediation model with total symptoms of ADHD as the predictor, communication dimension of AQ as mediator and total psychological distress as the outcome. **NS.** Not significant; **a1.** The effect of ADHD_T on communication; **b1.** The effect of communication on psychological distress; **c'.** Direct effect of ADHD_T on psychological distress; **X.** Independent variable;

**Y.** Dependent variable; **M.** Mediator; **ADHD.** Attention-Deficit/ Hyperactivity Disorder; **ADHD_T.** ADHD total symptoms; **TOTAL DASS-21.** Total Psychological Distress; **COM.** Communication dimension of Autism Spectrum Quotient.

***Note:*** Numbers represent unstandardized coefficients. Numbers in parentheses represent standard errors. *p < .05; **p < .01.

The second model, presented in figure 2, explored the mediational role of autistic communication deficits on the relationship between hyperactive symptom dimension of ADHD and psychological distress. Results indicated that the total effect of hyperactive symptoms of ADHD on psychological distress was significant (Effect = .9995, SE = .3522, p = .0081) but the direct effect was not. Hence, when controlling for the effect of communication deficits, the effect of ADHD hyperactive symptoms on psychological distress became non-significant. Table 5 also shows that the indirect effect of hyperactive symptoms of ADHD on psychological distress through communication deficits was non-significant (95% CI: - .1461 to .7184). The model explained 33.91% of psychological distress variance (F = 15.3922, p = .0005).

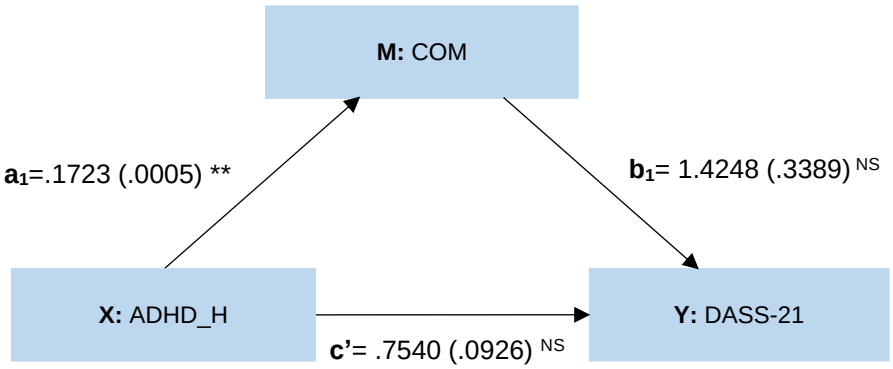


**Figure 2** – Serial multiple mediation model with hyperactive symptom dimension of ADHD as the predictor, communication dimension of AQ as mediator and total psychological distress as the outcome. **NS.** Not significant; **a1.** The effect of ADHD_H on communication; **b1.** The effect of communication on psychological distress; **c'.** Direct effect of ADHD_H on psychological distress; **X.** Independent variable; **Y.** Dependent variable; **M.** Mediator; **ADHD.** Attention-Deficit/ Hyperactivity Disorder; **ADHD_H.** ADHD hyperactive symptom dimension; **TOTAL DASS-21.** Total Psychological Distress; **COM.** Communication dimension of Autism Spectrum Quotient.

***Note:*** Numbers represent unstandardized coefficients. Numbers in parentheses represent standard errors. *p < .05; **p < .01.

The third model, presented in figure 3 explored the mediational role of autistic communication deficits on the relationship between inattentive ADHD symptom dimension and psychological distress. It explained 22.00% of the psychological distress variance (F = 2.6996, p = .0841). The total effect of inattentive ADHD symptoms on psychological distress was non-significant (Effect = .4341, SE = .4186, p = .3080), neither was the direct effect. The indirect effect of inattentive symptoms on psychological distress through autistic communication deficits was statistically significant (Effect = .4329), and statistically different from zero (95% CI: .0558 to .9850).

Contrarily to the historically popular "causal methods approach", there is now a consensus among statisticians postulating that it is legitimate to conclude that M mediates the association between X and Y even if the total effect is not significant. (31)

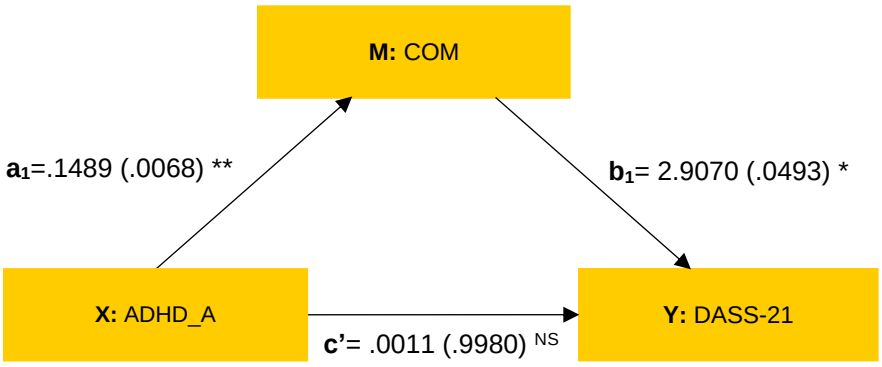


**Figure 3** – Serial multiple mediation model with inattentive symptom dimension of ADHD as the predictor, communication dimension of AQ as mediator and total psychological distress as the outcome. **NS.** Not significant; **a1.** The effect of ADHD_A on communication; **b1.** The effect of communication on psychological distress; **c'.** Direct effect of ADHD_A on psychological distress. **X.** Independent variable; **Y.** Dependent variable; **M.** Mediator; **ADHD.** Attention-Deficit/ Hyperactivity Disorder; **ADHD_A.** ADHD Inattentive symptom dimension; **TOTAL DASS-21.** Total Psychological Distress; **COM.** Communication dimension of Autism Spectrum Quotient.

***Note:*** Numbers represent unstandardized coefficients. Numbers in parentheses represent standard errors. *p < .05; **p < .01.

## 9. Discussion

Since the recognition of adult ADHD is relatively recent, most of the research related to ADHD has been conducted with children's samples. This gap motivated us to conduct the present study.

We questioned young adults (divided into two groups: diagnosed with ADHD and not diagnosed) about the presence of ADHD symptoms, ASD symptoms, and psychological distress. To our knowledge, this is the first study to investigate the relation between ADHD's and Autism Spectrum Quotient's dimensions, in an adult ADHD sample.

First, we began to compare the two groups regarding the frequency and dimensionality of the autistic traits. The ADHD sample had more global AT than the control sample. However, ADHD patients, as a group, did not reach the Autism Spectrum Quotient cut-off for a suspected autism diagnosis. These results are not surprising, considering that similar results have been described in children. (11, 19, 22, 23, 32)

Regarding the different domains of the AT, only Attention Switch, and Communication difficulties were reported at higher rate by the ADHD sample, also confirming past literature. (11, 33, 34) During neurocognitive tasks, ADHD patients show difficulties in task switch trials indicating the presence of deficits in flexibility engaging attention to different stimuli. Deficits in attention switching may explain why once the mind wanders (i.e., distractibility), individuals with ADHD are ineffective at switching the attention to relevant information. Thus, our results indicate that ADHD patients are not only more vulnerable getting distracted, but they also struggle to re-engage attention.

Regarding our correlation analyses, no significant correlation emerged between ADHD dimensions and attention switching. This is in line with our aforementioned hypothesis that distractibility and attention re-engagement (switch) are distinct phenomena that occur at different stages of the attentional process. First, attention deviates from its focus (distractibility), then the individual recognizes this deviation (self-monitoring), and re-engages (attention switching). Pearson correlations also indicated that communication deficits were the only domain of AT presenting significant relationships with ADHD dimensions: inattentive, hyperactive, and total.

Contradicting past studies, no differences emerged between the control and the ADHD samples in psychological distress variables. (35, 36) This can be explained by the fact that most patients included were on treatment (psychopharmacologic and or psychotherapeutic). Another explanation could be that our study was underpowered. On the other hand, in line with previous evidence (35, 36), we found a significant correlation between ADHD symptoms and total psychological distress (evaluated by the DASS-21 questionnaire).

Some explanatory theories of the disruptive pathways leading to psychological distress in ADHD postulate that anxiety disorders and depression develop secondarily to ADHD, i.e., false comorbidity. False comorbidity tends to occur if the attentional deficits, symptoms or difficulties remain undiagnosed or untreated for a very long period. This can lead to a chronic sensation of failure, frustration, disappointment and defeat. (37) Our hypothetical mediation models were based on this idea.

Mediational analysis denied an effect of communication in the relationship between ADHD total score, hyperactivity/impulsivity, and psychological distress. This is consistent with the existence of other explanatory pathways of psychological stress in patients with ADHD. (38)

In contrast, the relationship between inattentive ADHD symptoms and psychological distress was fully mediated by communication deficits. Hence, only when inattention exerts an enhancing effect on communication deficits, this relationship leads to the development of psychological distress. In other words, there was a pathway through which the specific relation between inattention and communication (without the contribution of other variables) leads to psychological distress. Noteworthy, this model supports that communication deficits may accrue from inattentive symptoms. In this explanatory pathway, communication difficulties are an epiphenomenon of inattention. Importantly, the mediation model denied a causal direct relation between inattentive dimensions and psychological distress (total effect) indicating a possible attenuating role of other factors that also relate to inattention. Thus, the effect of communication deficits may be particularly pernicious to inattentive ADHD patients.

Our results support the notion that, during social interactions, distractibility may cause difficulties in following verbal and non-verbal clues leading to communication difficulties and subsequently to discouragement, isolation, low self-esteem, and then, psychological distress. Contrarily to ASD, in ADHD patients, social communication deficits arise from an inability to process social information adaptively. Understanding the processes underlying social communication dimensions in ADHD has clinical implications, namely on treatment approaches. So, screening for communication difficulties in ADHD patients with predominantly inattentive symptoms, as well as effectively treating these symptoms, should prevent the development of psychological distress. Preventive strategies should approach core ADHD symptoms.

Last, while hyperactive symptoms often lessen with aging, inattentive symptoms persist more frequently. (39) By being the source of psychological distress already discussed, it gets even more vital to diagnose communication deficits in adults with ADHD to treat and prevent distress.

## 10. Strengths

Studying ADHD and related symptoms in adults is a strength of our study since most research on ADHD includes children. Also, there were no confounding effects of age, like sex, as those variable distributions did not differ across groups.

## 11. Limitations

The small size of our samples is a limitation of our results, some of which may be underpowered. Thus, results from the present study should be interpreted with caution as they are preliminary and exploratory. Namely, our mediational models must be confirmed in larger samples.

## 12. Conclusion

ADHD patients are at higher risk of presenting autistic-like attention switch problems and communication deficits. The pernicious effect of inattention on communication may lead to psychological distress in ADHD patients. This route might be important to prevent and treat psychological distress in patients with ADHD.

## 13. Acknowledgments

We want to thank all the patients that agreed to participate in this study. Without them it wouldn't have been possible.

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resident, Centro Hospitalar Psiquiátrico de Lisboa, Lisbon; Ana Rodrigues, PhD, Assistant Professor, University of Lisbon and Pin - Progresso Infantil; Gustavo Jesus, MD, Psychiatrist, Hospital.

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## 15. Annexes – Protocol

### *15.1 Sociodemographic questionnaire*

| | |
|---|---|
| 1. Que idade tem? | |
| 2. Sexo | a) Feminino<br>b) Masculino |
| 3. Qual o seu estado civil atual? | a) Solteiro (a)<br>b) Casado(a) / Vivo com companheiro(a)<br>c) Divorciado(a)/ Separado(a)<br>d) Viúvo(a)<br>e) Outra opção |
| 4. Qual é o seu grau de escolaridade? | a) 1º Ciclo (até ao quarto ano)<br>b) 2º Ciclo (até ao sexto ano)<br>c) 3º Ciclo (até ao nono ano)<br>d) Secundário<br>e) Licenciatura<br>f) Mestrado<br>g) Doutoramento<br>h) Outra opção |
| 5. Qual a sua profissão? | |
| 6. Como caracterizaria o seu local de residência? | a) Urbano<br>b) Rural |
| 7. Tem alguma doença mental diagnosticada? | a) Sim<br>b) Não |
| 8. Se tem alguma(s) doença(s) mental(ais) diagnosticada(s), por favor, enumera-a(s). | |

### *15.2 About ADHD – ADHD Group*

Por favor, responda às seguintes questões sobre a sua PHDA.

| | |
|---|---|
| 1. Desde que idade tem o diagnóstico de PHDA (Perturbação de Hiperatividade/Défice de Atenção)? | |
| 2. Faz alguma medicação para a sua PHDA? | a) Sim<br>b) Não |
| 3. Se sim, qual a medicação que está atualmente a fazer para a sua PHDA? | |

### *15.3 Adult ADHD Self-Report Screening Scale – version 1.1*

Por favor, responda às questões abaixo, classificando-se em relação a cada um dos critérios indicados. Ao responder a cada questão, assinale a opção que melhor descreve como se tem sentido ou comportado nos últimos 6 meses.

| | Nunca | Raramente | Algumas vezes | Frequentemente | Muito frequentemente |
|---|---|---|---|---|---|
| 1. Com que frequência sente dificuldade em finalizar os detalhes de um projeto, após terminar as partes mais desafiantes? | | | | | |
| 2. Com que frequência sente dificuldade em pôr as coisas em ordem quando tem de executar uma tarefa que exige organização? | | | | | |
| 3. Com que frequência sente dificuldade em lembrar-se de compromissos ou obrigações? | | | | | |
| 4. Com que frequência evita ou adia uma tarefa que exija muita concentração? | | | | | |
| 5. Com que frequência fica inquieto(a) ou mexe repetidamente as mãos e os pés, quando tem de estar sentado(a) durante um longo período de tempo? | | | | | |
| 6. Com que frequência se sente excessivamente ativo(a) e compelido(a) a fazer coisas, como se estivesse "ligado(a) à corrente"? | | | | | |
| 7. Com que frequência comete erros por descuido, quando tem de trabalhar num projeto aborrecido ou difícil? | | | | | |
| 8. Com que frequência tem dificuldade em manter a atenção quando está a realizar um trabalho aborrecido ou repetitivo? | | | | | |
| 9. Com que frequência tem dificuldade em se concentrar no que as pessoas dizem, mesmo quando falam diretamente consigo? | | | | | |
| 10. Com que frequência não sabe onde pôs ou tem dificuldade em encontrar coisas em casa ou no trabalho? | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 11. Com que frequência se distrai com atividades ou barulho à sua volta? | | | | | |
| 12. Com que frequência se levanta em reuniões ou noutras situações nas quais é suposto ficar sentado? | | | | | |
| 13. Com que frequência se sente irrequieto(a) ou agitado(a)? | | | | | |
| 14. Com que frequência sente dificuldade em desanuviar ou relaxar quando tem tempo para si? | | | | | |
| 15. Com que frequência dá por si a falar demasiado em situações sociais? | | | | | |
| 16. Quando está numa conversa, com que frequência dá por si a terminar as frases das outras pessoas antes que elas o façam? | | | | | |
| 17. Com que frequência tem dificuldade em esperar nas situações em que é necessário aguardar a sua vez? | | | | | |
| 18. Com que frequência interrompe outras pessoas quando estas estão ocupadas? | | | | | |

### *15.4 Autism Spectrum Quotient*

Eis uma lista de situações. Leia cada uma delas com atenção e assinale em que medida está ou não de acordo, escolhendo uma resposta.

| | | | | |
|---|---|---|---|---|
| 1. Prefiro fazer coisas com outras pessoas em vez de sozinho/sozinha. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 2. Prefiro fazer sempre tudo da mesma maneira. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 3. Quando tento imaginar algo, tenho muita facilidade em criar imagens mentais. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 4. Muitas vezes fico tão absorvido/absorvida numa coisa que perco de vista tudo o resto. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 5. Noto muitas vezes pequenos ruídos que passam despercebidos às outras pessoas. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 6. Costumo prestar atenção às matrículas dos automóveis ou a outras informações do mesmo género. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 7. Dizem-me muitas vezes que cometi uma indelicadeza quando me parece que fui bem-educado/educada. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 8. Quando leio uma história, consigo imaginar facilmente o aspeto das personagens. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 9. Tenho fascínio por datas. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 10. Quando estou em grupo, tenho facilidade em seguir várias conversas ao mesmo tempo. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 11. Para mim são fáceis as situações sociais. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 12. Tenho tendência a notar detalhes em que os outros não reparam. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 13. Prefiro ir a uma biblioteca mais do que a uma festa. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 14. Facilmente invento histórias. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 15. Atraem-me mais as pessoas do que as coisas. | concordo muito | concordo pouco | discordo pouco | discordo muito |

| | | | | |
|---|---|---|---|---|
| 16. Tendo a ter interesses fortes, e fico incomodado/incomodada se não posso dedicar-me a eles. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 17. Gosto de estar à conversa. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 18. Quando estou a falar, é difícil os outros tomarem a palavra. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 19. Adoro números. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 20. Quando leio uma história, acho difícil perceber as intenções das personagens. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 21. Não aprecio muito ler romances. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 22. Para mim é difícil fazer novos amigos. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 23. Estou sempre a reparar em padrões regulares naquilo que me rodeia. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 24. Aprecio mais ir ao teatro do que ir a um museu. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 25. Não me incomoda se houver alguma perturbação nos meus hábitos diários. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 26. Reparo muitas vezes que não sei como manter uma conversa. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 27. Acho fácil "ler nas entrelinhas" quando falam comigo. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 28. Normalmente concentro-me mais na imagem de conjunto e não nos detalhes. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 29. Não sou muito bom/boa a lembrar-me de números de telefone. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 30. Geralmente não reparo em pequenas mudanças numa situação, nem no aspeto de uma pessoa. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 31. Dou-me conta se a pessoa com quem estou a falar fica entediada (acha maçador). | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 32. É fácil fazer mais do que uma coisa ao mesmo tempo. | concordo muito | concordo pouco | discordo pouco | discordo muito |

| | | | | |
|---|---|---|---|---|
| 33. Quando estou ao telefone, não tenho a certeza de quando é a minha vez de falar. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 34. Gosto de fazer as coisas espontaneamente, sem planos. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 35. Muitas vezes sou o último/a última a perceber o sentido de uma piada. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 36. É fácil para mim perceber o que uma pessoa está a pensar ou a sentir apenas olhando para a sua cara. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 37. Se há alguma interrupção, rapidamente consigo voltar ao que estava a fazer. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 38. Sou um bom conversador /uma boa conversadora. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 39. Dizem-me muitas vezes que estou sempre a insistir na mesma coisa. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 40. Quando era criança, gostava de brincar com os colegas a jogos de faz-de-conta. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 41. Gosto de colecionar informação sobre tipos de coisas (por exemplo, tipos de carros, aves, comboios, plantas). | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 42. Tenho dificuldade em imaginar-me na pele de outra pessoa. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 43. Gosto de planear com cuidado todas as atividades em que participo. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 44. Gosto de acontecimentos sociais. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 45. Tenho dificuldade em perceber quais são as intenções das outras pessoas. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 46. As situações novas causam-me ansiedade. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 47. Gosto de conhecer pessoas novas. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 48. Tenho bom sentido diplomático. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 49. Não sou muito bom/boa a lembrar-me dos dias de anos. | concordo muito | concordo pouco | discordo pouco | discordo muito |
| 50. Tenho muita facilidade em fazer jogos de faz-de-conta com crianças. | concordo muito | concordo pouco | discordo pouco | discordo muito |

### *15.5 Depression Anxiety Stress Scale*

Para cada afirmação, coloque um círculo à volta do número que melhor corresponde ao seu grau de acordo ou desacordo relativamente à semana passada. Use a seguinte escala de avaliação.

| | | | |
|---|---|---|---|
| **0** (Não se aplicou nada a mim) | **1** (Aplicou-se a mim algumas vezes) | **2** (Aplicou-se a mim muitas vezes) | **3** (Aplicou-se a mim a maior parte das vezes) |

| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| 1. Tive dificuldades em me acalmar | | | | |
| 2. Senti a minha boca seca | | | | |
| 3. Não consegui sentir nenhum sentimento positivo | | | | |
| 4. Senti dificuldades em respirar | | | | |
| 5. Tive dificuldade em tomar iniciativa para fazer coisas | | | | |
| 6. Tive tendência a reagir em demasia em determinadas situações | | | | |
| 7. Senti tremores (por ex., nas mãos) | | | | |
| 8. Senti que estava a utilizar muita energia nervosa | | | | |
| 9. Preocupei-me com situações em que podia entrar em pânico e fazer figura ridícula | | | | |
| 10. Senti que não tinha nada a esperar do futuro | | | | |
| 11. Dei por mim a ficar agitado(a) | | | | |
| 12. Senti dificuldade em me relaxar | | | | |
| 13. Senti-me desanimado(a) e melancólico(a) | | | | |
| 14. Estive intolerante em relação a qualquer coisa que me impedisse de terminar aquilo que estava a fazer | | | | |
| 15. Senti-me quase a entrar em pânico | | | | |
| 16. Não fui capaz de ter entusiasmo por nada | | | | |
| 17. Senti que não tinha muito valor como pessoa | | | | |
| 18. Senti que por vezes estava sensível | | | | |
| 19. Senti alterações no meu coração sem fazer exercício físico | | | | |
| 20. Senti-me assustado(a) sem ter tido uma boa razão para isso | | | | |
| 21. Senti que a vida não tinha sentido. | | | | |