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MARIANA SOFIA DA GRAÇA BATISTA

***Compulsive eating and impulsivity in Attention-
Deficit/Hyperactivity Disorder patients***

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DRA. ANA ISABEL ARAÚJO

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***Compulsive eating and impulsivity in Attention-Deficit/Hyperactivity
Disorder patients***

Mariana Batista¹; Maria Diana Pascoal¹; Ana Araújo, MD²; António Macedo, MD, PhD².

¹ Faculty of Medicine, University of Coimbra, Portugal

² Institute of Psychological Medicine, Faculty of Medicine, University of Coimbra, Portugal

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 PHDA
2021

araujo.ana90@gmail.com

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

Ana Araújo^{1,2,3}, Maria Diana Pascoal⁴, Mariana Batista⁴, Fabiana Ventura^{1,2,3}, Nuno Madeira^{1,2,3}, Ana Telma Pereira^{1,3}, António Macedo^{1,2,3}

1 Instituto de Psicologia Médica, Faculdade de Medicina, Universidade de Coimbra; 2 Coimbra Institute for Biomedical Imaging and Translational Research, Universidade de Coimbra; 3 Centro de Responsabilidade Integrado em Psiquiatria, Centro Hospitalar e Universitário de Coimbra; 4 Faculdade de Medicina, Universidade de Coimbra

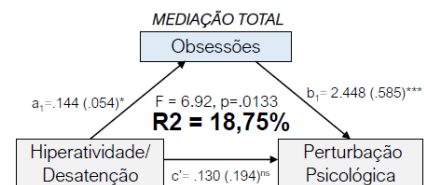
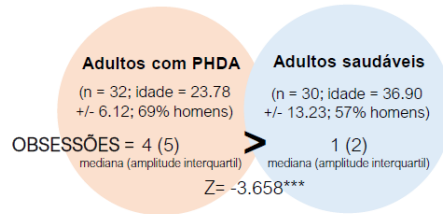


1. OBJETIVOS

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



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.

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

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

João Eduardo Lopes Boavida Fernandes

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



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



EPA 2022

Budapest, Hungary & Online | 4-7 June

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

Ana Araújo 1,2,3, Mariana Batista 4, Maria Diana Pascoal 4, Ana Telma Pereira 1,3, Fabiana Ventura 1,2,3, Nuno Madeira 1,2,3, António Macedo 1,2,3

1 Institute of Psychological Medicine, Faculty of Medicine, Coimbra University, Portugal

2 Coimbra Institute for Biomedical Imaging and Translational Research

3 Department of Psychiatry, Centro Hospitalar e Universitário de Coimbra, Portugal

4 Faculty of Medicine, University of Coimbra

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 (eg., 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 severer 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 severer 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.

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LIST OF ABBREVIATIONS

ADHD	Attention-Deficit/ Hyperactivity Disorder
ASRS-V1.1	The Adult ADHD Self-Report Screening Scale – version 1.1
BIS-11	The Barratt Impulsiveness Scale – version 11
CE	Compulsive Eating
CHUC	Coimbra Hospital and University Centre
DASS-21	The Depression Anxiety Stress Scale
DSM-5	The Diagnostic and Statistical Manual of Mental Disorders 5 th edition
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders, 4 th edition, text revision
ICD	Impulse Control Disorder
IQ	Intelligence Quotient
QUIP-CS	Parkinson's Disease Impulsive-Compulsive Disorders Questionnaire – Current Short
QUIP-D	Parkinson's Disease Impulsive-Compulsive Disorders Questionnaire – Eating Section

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RESUMO

Introdução: Apesar dos mecanismos ainda estarem mal esclarecidos, a Perturbação de Hiperatividade/Défice de Atenção (PHDA) constitui um fator de risco para a compulsão alimentar (CA). As semelhanças e diferenças nos processos subjacentes entre a CA na PHDA e as perturbações do comportamento alimentar foram ainda pouco investigadas. Dados iniciais sugerem que a CA pode ser secundária aos sintomas da PHDA (hiperatividade, impulsividade e desatenção). Perseguindo essa hipótese, os nossos objetivos foram: a) comparar os níveis de CA e impulsividade em adultos com PHDA e controlos saudáveis; b) em adultos com PHDA, estudar a correlação entre sintomas de PHDA, CA, impulsividade e perturbação psicológica; c) em adultos com PHDA, explorar o papel preditor dos sintomas de PHDA e de impulsividade na CA, controlando o efeito da perturbação psicológica.

Materiais e Métodos: 32 doentes com PHDA e 37 controlos saudáveis preencheram um protocolo online que incluiu questões clínicas e sociodemográficas e as versões portuguesas validadas dos seguintes questionários: *Adult ADHD Self-Report Screening Scale – version 1.1*; *Barratt Impulsiveness Scale*; *Parkinson's Disease Impulsive-Compulsive Disorders Questionnaire – Current Short*; Escala de Ansiedade, Depressão e Stresse 21. A análise descritiva, correlacional e mediacional foi realizada no SPSS 26 e PROCESS v3.5.

Resultados: O grupo com PHDA apresentou níveis mais elevados de sintomas de CA comparativamente ao grupo de controlo. Nos adultos com PHDA, a perturbação psicológica correlacionou-se com sintomas de PHDA e de CA, que, por sua vez, se correlacionou com sintomas PHDA e impulsividade. O modelo exploratório que incluiu a idade, sexo, perturbação psicológica e os sintomas da PHDA como preditores, explicou 47% da variância da CA na amostra PHDA. A PHDA, mas não a perturbação psicológica, teve o efeito de aumentar significativamente a probabilidade de ter sintomas de CA.

Discussão: Ao contrário das perturbações alimentares típicas, nas quais há ingestão alimentar como forma de lidar com estados de ansiedade e depressão, o nosso estudo sugere que, na PHDA, o mecanismo que leva a CA, pode ser explicado pelos sintomas nucleares de PHDA. É, portanto, essencial diagnosticar prontamente e tratar a PHDA, para prevenir a ocorrência de sintomas de CA e, conseqüentemente, quadros clínicos mais complexos.

Conclusão: Na gestão da CA, em pacientes com PHDA, devem ser adotadas estratégias terapêuticas que incluam também a PHDA, já que estes sintomas surgem secundariamente a esta.

Palavras-Chave: Perturbação de Hiperatividade/Défice de Atenção, Compulsão Alimentar, Impulsividade, Perturbação psicológica.

ABSTRACT

Background: Attention-Deficit/ Hyperactivity Disorder (ADHD) is a risk factor for Compulsive Eating (CE). Similarities and differences within the underlying processes across CE in ADHD and other eating problems have not been clarified. Initial studies indicate that CE in ADHD may arise secondarily from the ADHD core psychopathology. In this context, we aimed to: a) compare the frequency of self-reported CE symptoms and levels of impulsivity between ADHD patients and healthy controls; b) to analyze the correlations between ADHD dimensions, CE symptoms, impulsivity, and psychological distress, in the ADHD sample; c) to explore the predictor role of ADHD symptoms and impulsivity in CE, controlling for the effect of age, sex and psychological distress.

Materials and methods: 32 ADHD patients and 37 healthy controls took an online survey which included sociodemographic and clinical questions and the Portuguese validated versions of the following self-report questionnaires: Adult ADHD Self-Report Screening Scale – version 1.1; Barratt Impulsiveness Scale; Parkinson’s Disease Impulsive-Compulsive Disorders Questionnaire – Current Short; Depression Anxiety Stress Scale.

Results: Compared with controls, ADHD patients presented higher levels of impulsivity and CE symptoms. In the ADHD sample, psychological distress positively correlated with ADHD symptoms and CE, which correlated with ADHD symptoms and impulsivity. The exploratory model, including age, sex, psychological distress, and ADHD symptoms as predictors, explained 47% of the variance of CE in the ADHD sample. ADHD, but not psychological distress, had the effect of significantly increasing the odds of having CE.

Discussion: In contrast to what happens in typical eating disorders, in which patients ingest food to cope with anxious and depressive states, our study suggests that, in ADHD, the mechanism leading to CE might be explained by primary ADHD symptoms, which may constitute triggering and maintenance factors. Early diagnosis and treatment of ADHD are essential means to prevent the occurrence of comorbid CE symptoms and, subsequently, severer and more complex clinical pictures.

Conclusion: In ADHD patients with CE symptoms, therapeutic strategies should include the management of ADHD, since eating symptoms arise secondarily from ADHD psychopathology.

KEYWORDS: Attention-Deficit/ Hyperactivity Disorder, Compulsive Eating, Impulsivity, Psychological Distress.

INTRODUCTION

ADHD (Attention-Deficit/ Hyperactivity Disorder) is a neurodevelopmental condition, most frequently having its earliest manifestations in childhood. It is characterized by a persistent pattern of attention deficit, motor hyperactivity, and impulsiveness, having a negative impact on daily functioning.¹ ADHD symptoms are often potentially harmful to the individual and may be driven by a desire for immediate gratification, the need to quickly accomplish pleasure or arousal, or an incapability to postpone satisfaction. Making decisions without considering the long-term consequences – i.e., impulsivity – may occur, leading to impaired functioning.¹ ADHD is often related to lower scholar performance, poor academic and professional fulfillment, social rejection, and higher chances of unemployment and interpersonal conflicts.¹

Inattention is manifested by disorganization, lack of persistence, and difficulty maintaining focus while trying to complete a task, that is unrelated to the understanding or challengingness of the given task.¹ Hyperactivity implies excessive motor activity or extreme unease, unrest, and talkativeness (often perceived as exhausting to others).¹ Impulsivity reflects the tendency to act in a non-reflexive way, not taking into consideration the potential consequences of the hasty actions.² Because it also occurs across other disorders (eg.: addiction, impulse-control disorders, and obsessive-compulsive disorder), impulsivity has been regarded as a transdiagnostic process. This means that impulsivity partially explains comorbidity across neuropsychiatric disorders within the impulsive spectrum.

High comorbidity with other psychiatric disorders represents a significant burden for ADHD patients, their families, and society,³ because it is associated with severer clinical pictures and misdiagnosis. Adults with ADHD who have not been diagnosed through their life course are at higher risk of being misdiagnosed with other conditions, which symptoms are an epiphenomenon of the central ADHD psychopathology. In our investigation, we were interested in studying the comorbidity between ADHD and Compulsive Eating (CE).

CE is a disorder characterized by the occurrence of recurrent episodes of compulsive eating, occurring, at least, once a week, during 3 months. An episode of compulsive eating is defined by the ingestion, in a short period of time (usually, less than 2 hours), of an indisputably larger quantity of food, than most individuals would eat in similar circumstances. During these events, a sense of loss of control is often perceived, as an inability to resist the impulse or to stop eating once the event started.¹ Episodes of compulsive food ingestion usually arise when the individual is alone. Interruption by others (eg.: someone entering the room) leads to immediately finishing a CE episode.¹ The main characteristic of these events is a notion of

generalized discomfort or malaise and at least 3 of the following: food ingestion that is significantly faster than usual; eating until feeling unpleasantly full; the ingestion of large quantities of food, despite not feeling hungry; eating alone because of the embarrassment; feeling disappointed, depressed or a feeling of high culpability after the episode.¹

CE is associated with negative emotional states.⁴ In most cases, individuals report stress and “negative mood” as the most frequent precipitants⁵ resulting in the use of compulsive eating behaviours as a means to cope with anxiety and depressive states.

ADHD and its central manifestations of hyperactivity/impulsivity and inattention are risk factors for disordered eating, and particularly, for impulsive-compulsive eating problems.⁶ CE has been associated with severer global ADHD symptoms and higher levels of psychological distress.⁷

While it seems logical to suppose that there might be a link between ADHD and CE, the pathways leading to those symptoms are yet to be clarified. Previous research shows that eating dysregulation in ADHD arises secondarily from ADHD symptoms,⁶ i.e., inattentiveness, hyperactivity, and impulsivity. This contrasts with primary eating disorders in which compulsive behaviours are performed to alleviate states of psychological distress. Accordingly to the idea that eating symptoms in ADHD are epiphenomena of the primary psychopathology, our aims were to:

1. Compare the frequency of CE symptoms, levels of impulsivity, and psychological distress between ADHD and healthy control samples.
2. Study the correlations between ADHD dimensions and CE symptoms, impulsivity, and psychological distress, in individuals with ADHD.
3. Explore the predictive role of ADHD symptoms and impulsivity on CE symptoms, controlling for the effect of age, sex, and psychological distress.

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).

1. Subjects and procedure

Each participant was asked to take an online survey, including sociodemographic and clinical questions and four validated Portuguese versions of self-reported questionnaires, to evaluate ADHD symptoms, impulsivity, CE symptoms, and psychological distress. All subjects were fluent in the Portuguese language. Participants voluntarily provided written informed consent to participate in this study.

All healthy sample participants were recruited through social media. 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 5th edition) criteria, by a psychiatrist or a psychiatry resident with experience in neurodevelopmental disorders. Comorbidity with autism, obsessive-compulsive disorder, psychosis, substance dependence, and intellectual disability was assessed accordingly to DSM-5 criteria and was an exclusion criterion. Although none of the participants was evaluated for IQ (Intelligence Quotient) levels, all patients had functional levels that were indicative of normal intelligence.

All participants from the control sample (n=37) denied suffering from a psychiatric disorder(s) or being on psychiatry follow-up.

2. Measures

2.1. *Adult ADHD Self-Report Screening Scale – version 1.1*^{8,9}

The Adult ADHD Self-Report Screening Scale – version 1.1 (ASRS -v 1.1) is an 18-items self-assessment instrument to evaluate adult ADHD symptoms, according to DSM-IV-TR (Diagnostic and Statistical Manual of Mental Disorders, 4th 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.⁸ 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 of 24 or more indicates highly likely ADHD.

2.2. *Barratt Impulsiveness Scale (BIS – 11)*¹⁰⁻¹³

The Barratt Impulsiveness Scale (BIS-11) is a self-report questionnaire that measures the personality/behavioural construct of impulsivity. It is the most administered self-report measure to assess impulsivity in research and clinical settings. The current version has 30 items scored on a Likert scale from 0 (Rarely/Never) to 4 (Almost Always/Always) and presented good psychometric properties (Cronbach alpha .83). Factor analysis revealed six first-order factors (attention, cognitive instability, motor, perseverance, self-control, and cognitive complexity) and three second-order factors (attentional, motor, and non-planning). Portuguese versions of the BIS-11 showed good psychometric properties (Cronbach alpha .73 – .84). Patton et al. stated that “the [BIS-11] subfactors are of primary value in helping define impulsiveness in general and exploring more subtle relationships between impulsiveness and different clinical syndromes.”¹⁰

2.3. *Parkinson’s Disease Impulsive-Compulsive Disorders Questionnaire – Current Short (QUIP-CS)*¹⁴

The Parkinson’s Disease Impulsive-Compulsive Disorders Questionnaire – Current Short (QUIP-CS) is a self-assessment questionnaire composed of 13 questions, to evaluate the presence of Impulse Control Disorder (ICD) symptoms during a period of, at least, 4 weeks. The QUIP-CS is composed of five sections to evaluate the impulsive/compulsive dimensions

of gambling, buying, sex, eating, and automatic behaviours. In this study, we focused on the eating section (QUIP-D), where the participant answers “yes” or “no” to the following questions: *“Do you or other people think you have or had any overeating problems? (For instance, eating larger quantities or different types of aliments quicker than usual, and until you feel unpleasantly full, or eating when not hungry...)”*; *“Do you or did you have an uncontrollable desire to perform any eating habits that you believe or believed to be excessive, or a cause of disturbance (including experiencing unease or irritability whenever you cannot or could not fulfill the desire)?”*. Although the QUIP-CS was designed to be applied in Parkinson’s disease patients, our point in applying the QUIP-CS to ADHD patients was that impulsive dysregulation is a scarcely investigated but predominant feature of ADHD.

2.4. Depression Anxiety Stress Scale (DASS-21)^{15,16,17}

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, according 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). The DASS-21 Portuguese psychometric studies resulted in good parameters of reliability, construct, and concurrent validity and its factorial structure overlap with the original.¹⁷

3. Statistical analysis

Descriptive, Spearman coefficient correlation and Mann-Whitney U analyses were conducted using the software SPSS, version 26. X2 analyses were applied to analyze the dichotomous variables. Four exploratory binary logistic regression models were performed, based on the study’s hypotheses that ADHD symptoms (total score or dimensions) and impulsivity (total score or dimensions) would predict CE symptoms in ADHD patients, when controlling for the effect of age, sex, and psychological distress. Binary logistic regression is a statistical method to determine the reason-result relationship of independent variable(s) with a binary dependent variable. Binary logistic regression predicts group membership. In all four models, having CE symptoms (yes or no) was the independent variable. In the first block of all the regression models, we inserted age, sex, and psychological distress, therefore, controlling for the effect of those independent variables. The second block included impulsivity dimensions (model 1), total impulsivity (model 2), ADHD dimensions (model 3) and total ADHD (model 4). The assumptions of group exclusivity for each case were applied. The significance level was set at $p < 0.01$.

RESULTS

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)	T-test / 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 (total)	39.81 (11.05) / 40.00 (18.50)	28.24 (12.47) / 21.00 (20.50)	Z= -3.751; p< .001
ADHD (inattention)	21.53 (6.09) / 21.50 (9.00)	15.78 (6.51) / 14.00 (12.00)	Z= -3.401; p= .001
ADHD (hyperactivity)	18.28 (6.54) / 19.50 (11.50)	12.46 (6.53) / 10.00 (11.50)	Z= -3.400; p= .001
BIS-11 (total)	75.69 (9.90) / 76.00 (13.75)	61.89 (9.40) / 58.00 (15.50)	Z= -4.943; p< .001
BIS-11 (attentional)	22.28 (4.39) / 23.00 (7.00)	16.16 (3.83) / 16.00 (6.50)	Z= -4.873; p< .001
BIS-11 (motor)	24.00 (4.31) / 23.00 (6.75)	20.57 (5.00) / 19.00 (8.00)	NS
BIS-11 (non-planning)	29.41 (4.94) / 30.00 (7.00)	25.16 (3.39) / 25.00 (5.50)	Z= -3.688; p< .001
QUIP-D	yes= (18/ 56.25%)	yes= (11/ 29.73%)	X ² = 4.953; p= .026
DASS-21 (total)	19.69 (14.20) / 17.50 (20.50)	14.32 (11.27) / 12.00 (15.50)	NS

Table caption: **M.** Mean; **SD.** Standard Deviation; **Md.** Median; **IqR.** Interquartile Range; **NS.** Not significant; **ADHD (total).** ADHD total symptomatology; **ADHD (inattention).** ADHD Inattentive dimension; **ADHD (hyperactivity).** ADHD hyperactive dimension; **BIS-11 (total).** Impulsivity- total score; **BIS-11 (attentional).** Impulsivity- attentional domain; **BIS-11 (motor).** Impulsivity- motor domain; **BIS-11 (non-planning).** Impulsivity- non-planning domain; **QUIP-D.** Impulse-Control Disorders symptoms- eating related; **DASS-21 (total).** Total psychological distress.

Table 1 shows that no statistically significant differences were observed in gender or age distribution between 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%) of the participants, high education for 12 (37.5%), 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) and lisdexamfetamine (n= 3).

2. Differences in impulsivity, CE symptoms, and psychological distress between ADHD patients and the control sample

As shown in Table 1, when compared with the control sample, ADHD patients presented significantly higher levels of total impulsivity and attentional and non-planning domains ($p < .001$). ADHD patients also presented significantly higher levels of CE symptoms ($p = .026$).

3. Correlations between ADHD symptoms, impulsivity, CE symptoms and psychological distress – ADHD sample

Table 2: Spearman correlations between ADHD symptoms, impulsivity, CE symptoms, and psychological distress - ADHD sample.

	ADHD- Total	ADHD-A	ADHD-H	BIS.11- Total	BIS.11-A	BIS.11-M	BIS.11- NP	DASS-21 Total
QUIP-D	$\xi = .567$ $p = .001$	$\xi = .504$ $p = .003$	$\xi = .524$ $p = .002$	$\xi = .454$ $p = .009$	$\xi = .412$ $p = .019$	$\xi = .093$ $p = .614$	$\xi = .308$ $p = .086$	$\xi = .396$ $p = .025$
DASS-21 Total	$\xi = .401$ $p = .023$	$\xi = .362$ $p = .042$	$\xi = .468$ $p = .007$	$\xi = .278$ $p = .123$	$\xi = .445$ $p = .011$	$\xi = .089$ $p = .627$	$\xi = -.017$ $p = .925$	

Table caption: ξ . Spearman (non-parametric) correlation; **ADHD-Total.** ADHD total symptomatology; **ADHD-A.** ADHD Inattentive dimension; **ADHD-H.** ADHD hyperactive dimension; **BIS-11- Total.** Impulsivity- total score; **BIS-11-A.** Impulsivity- attentional domain; **BIS-11-M.** Impulsivity- motor domain; **BIS-11-NP.** Impulsivity- non-planning domain; **DASS-21 (total).** Total psychological distress; **QUIP-D.** Impulse-Control Disorders symptoms- eating related.

Table 2 shows that psychological distress significantly correlated with ADHD symptoms – total score and dimensions (from $p = .042$ to $p = .007$) and CE ($p = .025$). CE also correlated with ADHD symptoms – total score and dimensions (from $p = .003$ to $p = .001$) and impulsivity – total score and attentional domain (from $p = .019$ to $p = .009$).

4. Predictors of CE Symptoms

Logistic binary regression models were exploratory and were based on the information provided by correlational analyses results.

4.1 Predictor role of impulsivity and psychological distress in CE

Table 3: Summary of the logistic binary regression analysis with QUIP-D as the dependent variable and BIS-11 attentional domain as independent variable – ADHD sample.

DV	IV	Omnibus tests of model coefficients		Model summary	Beta	SE	p	OR	CI 95% OR	
		Chi-square	p	Nagelkerke R square					Inferior	Superior
QUIP-D	AGE	7.228	.065	.271	-.061	.067	.356	.940	.825	1.071
	SEX				.220	.936	.814	1.246	.199	7.803
	DASS-21 Total				.083	.041	.043	1.087	1.003	1.179
	AGE	2.502	.045	.351	-.061	.071	.388	.941	.819	1.081
	SEX				.413	.996	.678	1.512	.215	10.647
	DASS-21 Total				.054	.043	.204	1.056	.971	1.148
	BIS-11- A				.172	.114	.130	1.187	.951	1.483

Table caption: DV. Dependent Variable; IV. Independent Variable; SE. Standard error; OR. Odds ratio; CI 95% OR. Odds ratio 95% confidence interval; QUIP-D. Impulse-Control Disorders symptoms- eating related; DASS-21 Total. Total psychological distress; BIS-11- A. Impulsivity- attentional domain.

The first model was performed to analyze the impact of attentional impulsivity on CE symptoms, i.e., QUIP-D (dependent variable), controlling for the effect of age, sex, and psychological distress. Age, sex, and psychological distress were inserted in the first block of the model, which was not significant ($p = .065$). After adding attentional BIS-11, the model became significant ($p = .045$), and explained 35.1% of the variance of CE symptomatology. None of the predictors significantly increased the probability of having CE symptoms.

Table 4: Summary of the logistic binary regression analysis with QUIP-D as the dependent variable and BIS-11 total score as independent variable – ADHD sample.

DV	IV	Omnibus tests of model coefficients		Model summary	Beta	SE	p	OR	CI 95% OR	
		Chi-square	p	Nagelkerke R square					Inferior	Superior
QUIP-D	AGE	7.228	.065	.271	-.061	.067	.356	.940	.825	1.071
	SEX				.220	.936	.814	1.246	.199	7.803
	DASS-21 Total				.083	.041	.043	1.087	1.003	1.179
	AGE	4.345	.037	.407	-.029	.072	.689	.971	.843	1.120
	SEX				.775	1.020	.447	2.171	.294	16.039
	DASS-21 Total				.064	.044	.144	1.006	.978	1.162
	BIS-11 Total				.102	.054	.056	1.108	.997	1.230

Table caption: DV. Dependent Variable; IV. Independent Variable; SE. Standard error; OR. Odds ratio; CI 95% OR. Odds ratio 95% confidence interval; QUIP-D. Impulse-Control Disorders Symptoms- eating related; DASS-21 Total. Total Psychological Distress; BIS-11 Total. Impulsivity- total score.

The second model was performed to analyze the impact of total impulsivity (BIS.11 Total) on CE symptoms, i.e., QUIP-D (dependent variable), controlling for the effect of age, sex, and psychological distress. Age, sex, and psychological distress were inserted in the first block of the model, which was not significant ($p = .065$). After adding BIS-11 Total, the model became significant ($p = .037$), and explained 40.7% of the variance of CE symptomatology. None of the predictors significantly increased the probability of having CE symptoms.

4.2 Predictor role of ADHD symptomatology and psychological distress in CE

Table 5: Summary of the logistic binary regression analysis with QUIP-D as the dependent variable and ADHD dimensions as independent variables – ADHD sample.

DV	IV	Omnibus tests of model coefficients		Model summary	Beta	SE	p	OR	CI 95% OR	
		Chi-square	p	Nagelkerke R square					Inferior	Superior
QUIP-D	AGE	7.228	.065	.271	-.061	.067	.356	.940	.825	1.071
	SEX				.220	.936	.814	1.246	.199	7.803
	DASS-21 Total				.083	.041	.043	1.087	1.003	1.179
	AGE	6.850	.033	.477	-.047	.073	.518	.954	.828	1.100
	SEX				.124	1.025	.904	1.132	.152	8.435
	DASS-21 Total				.065	.042	.120	1.067	.983	1.159
	ADHD-A				.154	.090	.086	1.167	.979	1.139
ADHD-H				.082	.085	.331	1.086	.920	1.282	

Table caption: **DV.** Dependent Variable; **IV.** Independent Variable; **SE.** Standard error; **OR.** Odds ratio; **CI 95% OR.** Odds ratio 95% confidence interval; **QUIP-D.** Impulse-Control Disorders symptoms- eating related; **DASS-21 Total.** Total psychological distress; **ADHD-A.** ADHD Inattentive dimension; **ADHD-H.** ADHD hyperactive dimension.

The third model was performed to analyze the impact of ADHD dimensions (inattentive and hyperactive) on CE symptoms, i.e., QUIP-D (dependent variable), controlling for the effect of age, sex, and psychological distress. Age, sex, and psychological distress were inserted in the first block of the model, which was not significant ($p = .065$). After adding ADHD domains, the model became significant ($p = .033$), and explained 47.7% of the variance of CE symptomatology. None of the predictors significantly increased the probability of having CE symptoms.

Table 6: Summary of the logistic binary regression analysis with QUIP-D as the dependent variable and ADHD total score as independent variable – ADHD sample.

DV	IV	Omnibus tests of model coefficients		Model summary	Beta	SE	p	OR	CI 95% OR	
		Chi-square	p	Nagelkerke R square					Inferior	Superior
QUIP-D	AGE	7.228	.065	.271	-.061	.067	.356	.940	.825	1.071
	SEX				.220	.936	.814	1.246	.199	7.803
	DASS-21 Total				.083	.041	.043	1.087	1.003	1.179
	AGE	6.592	.010	.470	-.041	.072	.571	.960	.834	1.105
	SEX				.130	1.026	.899	1.139	.153	8.502
	DASS-21 Total				.058	.040	.146	1.060	.980	1.146
	ADHD Total				.117	.051	.021	1.125	1.018	1.243

Table caption: **DV.** Dependent Variable; **IV.** Independent Variable. **SE.** Standard error; **OR.** Odds ratio; **CI 95% OR.** Odds ratio 95% confidence interval; **QUIP-D.** Impulse-Control Disorders symptoms- eating related; **DASS-21 Total.** Total psychological distress; **ADHD Total.** ADHD total symptomatology.

The fourth model was performed to analyze the impact of ADHD total score on CE symptoms, i.e., QUIP-D (dependent variable), controlling for the effect of age, sex, and psychological distress. Age, sex, and psychological distress were inserted in the first block of the model, which was not significant ($p = .065$). After adding ADHD total score, the model became significant ($p = .010$), and explained 47.0% of the variance of CE symptomatology. ADHD total score significantly increased the odds ($OR = 1.125$ $p = .021$) of having CE symptoms.

DISCUSSION

The present study aimed to better understand the role of hyperactivity, impulsivity, and inattention in ADHD and how it relates to CE and psychological distress.

With this in mind, we started by comparing the frequency of impulsivity manifestations, CE symptoms, and psychological distress in ADHD patients vs. healthy controls. No statistically significant differences were observed in gender or age distribution between the two samples, allowing us to consider that those factors did not have a profound impact on the differences found.

As expected, the ADHD group presented significantly higher levels of total impulsivity and attentional and non-planning domains. This means that ADHD patients report struggling harder with maintaining attention in relevant information and in planning their life, than the average person. Our results are in line with the notion that impulsivity is a central feature of ADHD¹ and that, not only attentional – namely inattention – but also planning domains are implicated. The finding of subjective self-reported planning difficulties in our ADHD sample is in line with recent theories of the role of executive dysfunction in some adults with ADHD.³ However, this is not an obligatory dimension for diagnosing ADHD, suggesting some heterogeneity in (dis)executive symptoms across ADHD patients.³ Future studies, with larger samples, should explore the meaningfulness of clustering ADHD patients according to non-planning impulsivity and other traits, that are potentially related with executive deficits. In the present study, conducted in adult samples, levels of motor impulsivity did not differ across groups, which was unexpected. We suggest that the impact of motor impulsivity in ADHD may attenuate with age. This is in line with the well-described decrease in hyperactivity symptoms from childhood to adulthood.

Regarding CE symptoms, these were also significantly and more frequently reported by ADHD patients, when compared to the control group. Similar results have been found among children and teenagers by Sawnsen et al., resulting in the assumption that ADHD and food-related impulsivity may be linked.¹⁸ Our study extends the link between ADHD and food ingestion dysregulation to adults. Research on binge eating, carried out by Cortese et al. also confirms this connection between both pathologies.¹⁹ A third study on ADHD and its comorbidities also came up with the same conclusions, considering ADHD as a risk factor for the development of disordered eating.⁶

Results from our correlational analysis, also indicate a positive, significant, and bidirectional link between CE symptoms and ADHD symptoms (total score and dimensions). A possible explanation for this is that, as hypothesized by Cortese et al. and, later, supported

by Seymour et al., ADHD and CE behaviours may share some neurobehavioral circuits, specifically deficient inhibitory control, which is an important manifestation of the impulsivity dimension of ADHD.^{19,20} This may lead to abnormal eating patterns, such as CE. A positive significant relationship was also found between CE and the attentional domain of impulsivity, suggesting a key role of (in)attention in CE, in ADHD patients.

To sum up, both impulsive and inattentive components of ADHD might promote disordered eating patterns, including CE behaviours.¹⁹

To clarify to which extent ADHD symptoms and impulsivity predict CE, we performed four binary logistic regression models, using CE symptoms as the dependent variable, and controlling for the effect of age, sex, and psychological distress. This was according to our hypothesis that the role of ADHD symptoms and impulsivity would be prevailing to psychological distress, in the development of CE symptoms, in ADHD patients. All models were exploratory and significant. Only ADHD total score was a significant predictor of CE symptoms (fourth model).

The fourth model (first block: age, sex, psychological distress; second block: ADHD total score) was significant and accounted for 47.0% of the variance of having CE symptoms (yes or no). The model also showed that the effect of ADHD total score on CE was significant, but the effect of age, sex, and psychological distress was not. This means that, even when controlling for the role that age, sex, and psychological distress have on the development of CE symptoms in ADHD patients, the severity of ADHD symptoms – both hyperactivity/impulsivity and inattention – is predominant. Independently, ADHD dimensions were not significant, indicating that the risk of having CE occurs when both dimensions are present.

Our results are in line with those of Tistarelli et al. proposing that, in late adolescents with ADHD, abnormal eating patterns, including CE, seem to be primarily a result of inattention and impulsivity ADHD dimensions, even when taking into consideration anxiety and depression manifestations.⁶ This means that, opposingly to what happens in typical eating disorders, in which patients ingest food as a way of dealing with their negative emotions (anxiety and depression), in ADHD, a distinct mechanism may be implicated. Our results elucidate that, in ADHD patients, severer core symptoms (inattention, hyperactivity, and impulsivity), but not, primary anxiety or depression, contribute to eating dysregulation. In clinical settings, untreated/mistreated ADHD patients are at higher risk of getting into impulsive behaviours of food-seeking. Hyperactivity may contribute to performing acts of eating. Inattention hampers self-monitoring leading to repetition of actions (food ingestion) that are no longer useful or goal-directed. Other authors have suggested that inattention leads to a lack of

awareness in what concerns the perception of hunger and satiety.^{6,19} This may result in a tendency to forget to eat when engaged in captivating scenarios and to eat when less stimulated.²¹ Similarly, deficits in planning domains, also very common in ADHD diagnosed individuals, might imply struggling with committing to regular eating habits, predisposing to atypical eating patterns.¹⁹ These are all hypothetical explanations of CE behaviours in ADHD, that put ADHD core symptoms, instead of negative emotions, as triggering and maintenance factors. Hereby, we emphasize the relevance of diagnosing and treating ADHD symptoms to prevent the occurrence of comorbid CE symptoms and subsequently severer and more complex clinical pictures. Further, undiagnosed ADHD patients presenting with false comorbidity – i.e., symptoms (CE) that are secondary to the central pathology (ADHD) but are diagnosed as a co-occurring distinct phenomena – may be at higher risk.

As limitations to this study, we must take into account that our binary logistic regression analysis did not follow the assumption of at least 10 (ideally 20) observations per independent variable²³ and our results should be interpreted with caution because of probable bias. Our models are exploratory and preliminary and should be confirmed in larger samples. However, challenges of data collection from a clinical sample should be considered. Particularly, features of ADHD lead to further difficulties in getting engaged and filling out self-report questionnaires. To minimize the impact of this limitation, we asked ADHD patients to rate the difficulty of answering our questionnaire. Then, feedback from ADHD patients was included in the final version of the protocol. Although self-assessment scales are based on subjective, and sometimes retrospective, evaluations of one's traits and behaviours, questionnaires used in the present study have been extensively applied and are validated for the Portuguese population.

The fact that we focused on adult ADHD is a strength of our study since most ADHD research is centered on children.

CONCLUSION

In conclusion, as previously stated, our study shows that, differently from what occurs in typical eating disorders, in which food ingestion is the means to achieve relief from negative emotional states, such as anxiety and depression, in ADHD, these disruptive eating patterns are a product of its inattention and hyperactive/impulsive dimensions. As a result, misdiagnosed or mistreated ADHD patients are at higher risk of developing CE symptomatology at some point in their clinical evolution. Therefore, we highlight the importance of promptly and correctly diagnosing ADHD. Further, in CE patients with underlying ADHD, the chosen therapeutic strategies should always consider the management of the primary psychopathology, since ADHD symptoms have an enhancing effect on eating symptoms.

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ATTACHMENTS

Attachment 1 – Questionnaire:

Sociodemographic Questionnaire

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

Clinic Questionnaire – ADHD group

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 b) Não
3. Se sim, qual a medicação que está atualmente a fazer para a sua PHDA?	

Adult ADHD Self-Report Screening Scale – version 1.1 (ASRS – v1.1)

<p>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.</p>	<p>Nunca</p>	<p>Raramente</p>	<p>Algumas vezes</p>	<p>Frequentemente</p>	<p>Muito frequentemente</p>
<p>1. Com que frequência sente dificuldade em finalizar os detalhes de um projeto, após terminar as partes mais desafiantes?</p>					
<p>2. Com que frequência sente dificuldade em pôr as coisas em ordem quando tem de executar uma tarefa que exige organização?</p>					
<p>3. Com que frequência sente dificuldade em lembrar-se de compromissos ou obrigações?</p>					
<p>4. Com que frequência evita ou adia uma tarefa que exija muita concentração?</p>					
<p>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?</p>					
<p>6. Com que frequência se sente excessivamente ativo(a) e compelido(a) a fazer coisas, como se estivesse "ligado(a) à corrente"?</p>					
<p>7. Com que frequência comete erros por descuido, quando tem de trabalhar num projeto aborrecido ou difícil?</p>					
<p>8. Com que frequência tem dificuldade em manter a atenção quando está a realizar um trabalho aborrecido ou repetitivo?</p>					
<p>9. Com que frequência tem dificuldade em se concentrar no que as pessoas dizem, mesmo quando falam diretamente consigo?</p>					
<p>10. Com que frequência não sabe onde pôs ou tem dificuldade em encontrar coisas em casa ou no trabalho?</p>					
<p>11. Com que frequência se distrai com atividades ou barulho à sua volta?</p>					
<p>12. Com que frequência se levanta em reuniões ou noutras situações nas quais é suposto ficar sentado?</p>					
<p>13. Com que frequência se sente irrequieto(a) ou agitado(a)?</p>					

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?					

BIS-11

“As pessoas divergem nas formas em que agem e pensam em diferentes situações. Esta é uma escala para avaliar algumas das maneiras como você age ou pensa. Leia cada afirmação e preencha o círculo apropriado no lado direito da página. Não gaste muito tempo em cada afirmação. Responda de forma rápida e honestamente.”

1	2	3	4
Quase Nunca	Algumas vezes	Frequentemente	Quase sempre
1. Eu planeio tarefas cuidadosamente.			
2. Eu faço coisas sem pensar.			
3. Eu tomo decisões rapidamente.			
4. Eu sou despreocupado(a) (confio na sorte).			
5. Eu sou pouco atento(a).			
6. Eu tenho pensamentos que se atropelam.			
7. Eu planeio viagens com bastante antecedência.			
8. Eu tenho autocontrole.			
9. Eu concentro-me facilmente.			
10. Eu poupo dinheiro.			
11. Eu fico irrequieto(a) em peças de teatro ou palestras.			
12. Eu penso nas coisas cuidadosamente.			
13. Eu tomo precauções para me manter no emprego/ eu preocupo-me em não perder o meu emprego (ex.: cumprir horários, cumprir ordens).			
14. Eu digo coisas sem pensar.			
15. Eu gosto de pensar em problemas complexos.			
16. Eu mudo de emprego.			
17. Eu ajo por impulso.			
18. Eu fico facilmente entediado(a) quando estou a resolver problemas mentalmente.			
19. Eu ajo no “calor” do momento (sou precipitado(a)).			
20. Eu mantenho a linha de raciocínio (“não perco o fio da meada”).			
21. Eu troco de casa (residência).			
22. Eu compro coisas por impulso.			
23. Eu só consigo pensar numa coisa de cada vez.			
24. Eu troco de interesses e passatempos.			
25. Eu gasto ou compro a prestações mais do que o que ganho.			
26. Enquanto estou a pensar numa coisa, é comum que outras ideias intrusas me venham à cabeça ao mesmo tempo.			
27. Eu tenho mais interesse no presente do que no futuro.			
28. Eu sinto-me inquieto(a) em palestras ou aulas.			
29. Eu gosto de jogos e desafios mentais.			
30. Eu preparo-me para o futuro.			

QUIP-CS

“Responda a todas as perguntas com base nos comportamentos exibidos, por si, durante um episódio com duração mínima de 4 semanas.”

A. JOGOS DE AZAR

1. Acha ou outras pessoas acham que tem ou teve algum problema com participação excessiva em jogos de azar (por exemplo, casinos, apostas pela internet, loterias raspadinhas, póquer)? Sim Não

2. Tem ou teve alguma dificuldade em controlar o seu comportamento em relação a jogos de azar (como, por exemplo, jogar cada vez mais com o passar do tempo ou ter dificuldades em reduzir ou parar)? Sim Não

B. SEXO

1. Acha ou outras pessoas acham que tem ou teve algum problema relacionado com o seu comportamento sexual (tal como exigir sexo de seus parceiros, mudança da orientação sexual, masturbação, atividades sexuais pela internet ou telefone ou pornografia)? Sim Não

2. Pensa ou já pensou demais sobre comportamentos sexuais (por exemplo, não conseguir tirar o assunto da cabeça ou sentir-se culpado)? Sim Não

C. COMPRAS

1. Acha ou outras pessoas acham que tem ou teve algum problema relacionado com compras excessivas (tal como, comprar um produto em excesso ou comprar coisas que não precisa ou não usa)? Sim Não

2. Envolve-se ou envolveu-se em atividades especificamente com o propósito de continuar com o comportamento relacionado com compras (por exemplo, esconder o que está a fazer, mentir, esconder os produtos, pedir empréstimos, acumular débitos)? Sim Não

D. ALIMENTAÇÃO

1. Acha ou outras pessoas acham que tem ou teve algum problema relacionado com comer demais (por exemplo, passar a comer quantidades maiores ou tipos diferentes de alimentos, mais rapidamente que o normal, até sentir-se desconfortavelmente cheio ou comer quando não está com fome)? Sim Não

2. Tem ou teve um desejo incontrolável de realizar algum hábito alimentar que você acredita ou acreditava ser excessivo ou causar incômodo (incluindo sentir inquietação, irritabilidade, sempre que não consegue realizar o desejo)? Sim Não

E. OUTROS COMPORTAMENTOS

Acha ou outras pessoas acham que passa ou passava tempo demais...

1. ... em tarefas específicas, passatempos ou outras atividades organizadas (tais como jogar/usar o computador escrever, pintar, cuidar do jardim, consertar ou desmontar objetos, fazer coleções, trabalhar em projetos etc.)? Sim Não

2. ... a repetir certas atividades motoras simples (por exemplo, limpar, arrumar, examinar objetos, classificá-los, organizá-los, etc)? Sim Não

3. ... a andar ou conduzir sem um destino ou objetivo específico? Sim Não

Depression Anxiety Stress Scale (DASS-21) - EADS-21

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