

Studi sperimentali

Attention to detail in Italian parents of women with anorexia nervosa: a comparative study

Attenzione per i dettagli in genitori di nazionalità italiana di donne affette da anoressia nervosa: uno studio comparativo

ALESSANDRO CHINELLO¹, LUIGI ZAPPA^{2,3}, MIRIAM PASTORI³, CRISTINA CROCAMO²,
PAOLA RICCIARDELLI¹, MASSIMO CLERICI², GIUSEPPE CARRÀ²

E-mail: alessandro.chinello@gmail.com

¹Department of Psychology, University of Milano-Bicocca, Milan, Italy

²Department of Medicine and Surgery, University of Milano-Bicocca, Milan, Italy

³Mental Health Department, Monza Health and Social Care Trust, Monza, Italy

SUMMARY. Aim. Anorexia nervosa (AN) and autistic spectrum disorder (ASD) may share traits such as mental rigidity and attention to detail, some of which might be familial. We aimed to investigate the distribution of autistic traits among parents of daughters suffering from eating disorders (anorexia or bulimia nervosa), comparing them with control parents. **Methods.** As a whole, 40 parents of women with eating disorders (60% AN, 40% BN) and 33 control parents were recruited and accepted an examination through the administration of the autism spectrum quotient (AQ). The effects of eating disorders and other psychiatric traits were excluded by using EAT-26 and SCL-90-R respectively, while decision making skills were ruled out by using the cognitive estimation task (CET). **Results.** AQ scores revealed a between-groups difference for a specific trait, showing a reduction in attention to detail among ED family members, especially AN parents. **Discussion.** These findings suggest a preference for global processing in AN parents in contrast to what found in AN patients. Our findings support the role of a candidate trait in AN parents, supporting the need of further studies on the role of attention to detail as a family marker. **Conclusion.** This study identified a global processing preference in AN parents, suggesting a role of attention to detail as an ideal marker to be included in a wider clinical assessment for AN patients and their families. Considering some study limitations, further research is needed.

KEY WORDS: anorexia, attention, autism, bulimia, OCD.

RIASSUNTO. Scopo. È noto come l'anoressia nervosa (AN) e il disturbo dello spettro autistico (ASD) condividano alcuni tratti, come la rigidità mentale e l'attenzione per i dettagli, che potrebbero essere diffusi a livello familiare. Questo studio ha lo scopo di confrontare la distribuzione di tratti autistici in genitori con figlie affette da disturbo alimentare ED (anoressia - AN o bulimia nervosa - BN) con genitori appartenenti a un gruppo di controllo. **Metodi.** Sono stati coinvolti 40 genitori con figlie affette da disturbo alimentare (60% con anoressia, 40% con bulimia nervosa) e 33 genitori di controllo. Tutti i genitori hanno compilato questionari specifici riguardanti il quoziente di spettro autistico (AQ) e le stime cognitive (CET). Inoltre, sono stati somministrati EAT-26 e SCL-90-R al fine di escludere la presenza di disturbi psichiatrici o alimentari nel gruppo sperimentale. **Risultati.** Le analisi su AQ mostrano una differenza tra i due gruppi per un tratto autistico specifico, evidenziando una riduzione significativa dell'attenzione per i dettagli nel gruppo sperimentale (ED), in particolare nei genitori di figlie affette da AN. **Discussione.** Questi dati suggeriscono una preferenza per un'elaborazione globale delle informazioni nei genitori AN in contrasto a quanto trovato in pazienti con AN. La presenza di aspetti depressivi, ansiosi e di disturbi alimentari è stata esclusa nei genitori nel gruppo sperimentale tramite SCL-90-R e EAT-26. Infine, la capacità di prendere decisioni, misurata dal CET, è stata esclusa dalle nostre analisi. **Conclusione.** Nei genitori con figlie affette da AN emerge una peculiare preferenza per un'elaborazione cognitiva globale, suggerendo il ruolo dell'attenzione per i dettagli come nuovo fattore da considerare nelle valutazioni cliniche di pazienti con AN e nei loro familiari. Considerando i limiti dello studio, ulteriori approfondimenti in merito sono necessari.

PAROLE CHIAVE: anoressia, attenzione, autismo, bulimia, OCD.

INTRODUCTION

Overlapping neuropsychological dysfunctions and traits seem to characterize both individuals with autistic spectrum disorders (ASD) and those with anorexia nervosa (AN)¹. In-

deed, modifications of set-shifting, mental rigidity, and attention to detail were found in both ASD and AN, supporting the hypothesis of a shared cognitive profile²⁻⁵. Recent neuropsychological evidence has shown a moderate heritability of decision-making impairments while performing the Iowa

Gambling Task, suggesting the presence of a common deficiency in decision-making and set-shifting in women with AN^{6,7} and their unaffected relatives⁸. In particular, autistic quotient (AQ) levels among people with AN are higher than those found in healthy controls^{9,10}, with an association with a broad autistic phenotype in more than 40% of AN cases¹¹. However, relatives, posing a family association of autistic traits¹², might share some of these traits. Indeed, recent research seems suggesting the aggregation of autistic traits among individuals with AN and their relatives^{1,13}, with mental rigidity and attention to detail being major candidate domains¹⁴. These family-distributed features may constitute an additional risk factor in particular for women with AN¹⁵. Although these traits and executive impairments (i.e., decision-making) appear putative correlates for women with AN, similar patterns in their unaffected relatives have been poorly studied so far, and there is the need for more thorough exploration, trying to clarify specific autistic traits and relevant correlates.

We hypothesized that relatives of women with AN might have more severe autistic traits as compared with both control parents and those of women with bulimia nervosa (BN), focussing on mental rigidity and attention to detail. Thus, we aimed to comparatively explore the distribution of autistic traits among parents of people with Eating Disorders (EDs) and control parents, identifying specific correlates, if any, in terms of individual's general psychopathological symptom severity.

METHODS

Setting and sample

We purposively selected forty parents, who had daughters suffering from DSM-5 EDs¹⁶, from the Eating Disorders Unit of S. Gerardo Hospital, Monza, Italy.

Control parents were conveniently recruited via personal contacts of colleagues working at Maria Bianca Corno Charity, from the same catchment area. An experienced psychologist interviewed them to rule out any current psychiatric disorders.

Measures and procedures

The study was observational, as no intervention was made either by, or at the behest of, the research team. A battery of instruments was used to collect information. The autism spectrum quotient (AQ) is a self-administered questionnaire that was used to assess autistic traits in different domains (social skills, communication, imagination, attention switching and attention to detail). It was designed to be administered also to the general population^{17,18}. Relevant cut-offs for the AQ Italian version are fully reported elsewhere¹⁹. Body Mass Index (BMI) was calculated according to the [weight (kg)/height (m)²] formula²⁰. The Italian version of the self-administered, 90-item Symptom Check List-90-R (SCL-90-R), was used to measure self-reported severity of psychopathological symptoms²¹. It consists of nine specific subscales, i.e., somatisation, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, with an additional scale for disturbances in appetite/sleep. Three general scores are generated, including Global Severity (GSI); Positive Symptom Total (PST); and Positive Symptom

Distress (PSDI), indices. Thus, the presence of depressive and anxiety-related traits was excluded among parents of daughters with EDs based on SCL-90-R, while the 26-item version of the Eating Attitudes Test (EAT-26) was administered to rule out eating problems in ED parents. Finally, the Cognitive Estimation Task (CET)²² was used to measure decision-making features of executive functioning, in order to exclude any relevant confounding variables.

All parents were interviewed in a session lasting one hour, in a quiet room. A written informed consent, following full explanation of study purposes, was obtained from participants. Analyses were carried out using Stata statistical software package (version 13.1; Stata Corp, College Station, Texas). Level of significance was set at 5%, and all p-values were two-tailed. Univariate comparisons between groups for categorical data were made using Pearson's chi-square test, and Student t test for continuous variables. We used a linear regression model, controlling for gender, age, marital status, and reasoning ability (CET errors), and for any further variable associated at univariate level to assess the impact of being a parent of women suffering from EDs on AQ scores.

RESULTS

Women from our sample had been clinically diagnosed with DSM-5 anorexia (60%) or bulimia (40%) nervosa, had a mean age of 22.1 years (SD=5.2), ED length of 4.3 years (SD=2.8), with average onset at 17.8 years (SD=4.9). All of their parents lived in Northern Italy (26 mothers and 14 fathers; cumulative mean age=53.0 years, SD=5.4), mostly with a high-school diploma (70%), married (80%), with more than a child (70%), and with an average purposively measured BMI of 23.6 kg/m² (SD=2.7). None of the parents suffered from any eating disorders, all reporting EAT-26 scores lower than seven (cut-off ≥ 20)²³, though with a limited, continued, use of psycho-pharmacological medications (1 and 4 subjects used anxiolytic and antidepressant drugs, respectively).

Similarly, 33 control parents (mean age=24.2, SD=5.8), including 18 mothers and 15 fathers (mean age=55.5 years, SD=4.1), mainly with a high-school diploma (52%), married (94%), with more than a child (67%), mean BMI of 24.6 kg/m² (SD=3.0), and reporting no psycho-pharmacological treatments, were recruited. In Table 1, parents of women with

Table 1. Sociodemographic and clinical characteristics among EDs and control parents.

Variable	EDs parents	Control parents
Sex: male	14 (35%)	15 (45%)
Marital status: married/cohabiting	32 (80%)	31 (94%)
Education: \geq high school	34 (85%)	28 (85%)
Age: mean (SD), yrs.	53.03 (5.45)	55.55 (4.13)
Daughter's age: mean (SD), yrs.	22.08 (5.23)	24.18 (5.82)
BMI: mean (SD), kg/m ²	23.56 (2.74)	24.61 (2.97)
CET: mean (SD), errors	13.25 (3.48)	13.39 (3.45)

Attention to detail in Italian parents of women with anorexia nervosa: a comparative study

EDs are compared with control participants on main sociodemographic and clinical characteristics, showing comparable profiles apart from mean age, which was significantly older among control parents.

AQ total and subscale scores are shown in Table 2. Although total scores did not differ, AQ mean attention to detail subscale scores were significantly lower among ED relatives. Indeed, this was true for mothers of women with EDs ($p=.001$), whilst no difference was reported for fathers ($p=.48$), as compared with relevant controls.

In addition, we ran a multiple linear regression model exploring the impact of being a parent of women suffering from anorexia, rather than bulimia nervosa, on AQ attention to detail subscale score, controlling for potential confounders (i.e., parent's gender and age, marital status, CET errors). The only explanatory variables statistically significant in the model were being a parent of women suffering from anorexia (coefficient=-1.43, 95%CI -2.62 to -.23; $p=0.02$), and CET errors (coefficient=-0.20, 95% CI -0.36 to -0.05; $p=0.009$).

DISCUSSION

In the last decades, neurocognitive research has focused mainly on ED patients with limited attempts to cognitively characterize AN family members within a biopsychosocial model of eating disorders²⁴. Within this framework, our study aimed to investigate the distribution of autistic traits in AN family members, comparing their autistic spectrum profiles with both control parents and BN parents.

It was found that levels of AQ were similar for both EDs parents and controls, with the only exception being represented by attention to detail which exhibited a significant reduction for ED parents. In addition, differences in attention to detail were not influenced by psychiatric traits (e.g. OC traits, depression, anxiety) or accuracy in decision making for CET of ED parents. On the other hand, the other AQ domains (social skills, communication, imagination, attention switching) showed similar scores for ED parents and controls, comparable to normative data¹⁹. Interestingly, the attention reduction emerged mainly in AN parents, highlighting a stronger trait distribution among unaffected parents on the basis of the daughter's eating disorder (AN vs. BN). It is worth emphasizing that AN¹⁴, BN²⁵ and ASD

patients^{26,27}, all show opposite patterns for this trait. In addition, AN patients report higher attention to detail and no preference for global processing²⁸⁻³⁰. This was not the case for AN family members from our study, who seem more prone to use a global processing with limited attention to detail.

Moreover, parental gender seems able to explain other relevant differences since EDs mothers show lower attention to detail as compared with controls, suggesting possible effects on mother-daughter interaction^{31,32}. In sum, attention to detail reduction, might represent a candidate pattern in AN parents, for further studies on ED families.

Some limitations need to be considered, suggesting caution in interpreting our findings. First, a cross-sectional approach obviously did not allow causal inferences about the direction of the relationship between eating disorders and autistic traits. Alternatively, a longitudinal approach can better clarify the interplay between anorexia nervosa and attention to detail over time. Second, although we controlled for CET and several sociodemographic characteristics, we could not consider relevant domains such as EDs severity and length. Third, the sample size is too small, and further larger studies are required to confirm these results.

In conclusion, this study identified a global processing preference, though with reduced attention to detail, in AN family members. New cognitive approaches should consider attention to detail as an ideal marker to be included in a wider clinical assessment for AN patients and their families.

Acknowledgements: we thank the Maria Bianca Corno Charity (Monza, MB, Italy) for the unrelenting promotion of research about eating disorders.

Conflict of interest: the authors declare no conflict of interest.

REFERENCES

1. Rhind C, Bonfioli E, Hibbs R, et al. An examination of autism spectrum traits in adolescents with anorexia nervosa and their parents. *Mol Autism* 2014; 5: 56.
2. Fassino S, Pieró A, Daga GA, Leombruni P, Mortara P, Rovera GG. Attentional biases and frontal functioning in anorexia nervosa. *Int J Eating Disord* 2002; 31: 274-83.
3. Zucker NL, Losh M, Bulik CM, LaBar KS, Piven J, Pelphrey KA. Anorexia nervosa and autism spectrum disorders: guided investigation of social cognitive endophenotypes. *Psychol Bull* 2007; 133: 976-1006.
4. Oldershaw A, Hambrook D, Stahl D, Tchanturia K, Treasure J, Schmidt U. The socio-emotional processing stream in Anorexia Nervosa. *Neurosci Biobehav Rev* 2011; 35: 970-88.
5. Treasure J. Coherence and other autistic spectrum traits and eating disorders: building from mechanism to treatment. The Birgit Olsson lecture. *Nord J Psychiatry* 2013; 67: 38-42.
6. Cavedini P, Bassi T, Ubbiali A, et al. Neuropsychological investigation of decision making in anorexia nervosa. *Psychiatry Res* 2004; 127: 259-66.
7. Tchanturia K, Campbell IC, Morris R, Treasure J. Neuropsychological studies in anorexia nervosa. *Int J Eating Disord* 2005; 37 (S1): S72-S6.
8. Galimberti E, Fadda E, Cavallini MC, Martoni RM, Erzegovesi S, Bellodi L. Executive functioning in anorexia nervosa patients and their unaffected relatives. *Psychiatry Res* 2013; 208: 238-44.
9. Hambrook D, Tchanturia K, Schmidt U, Russell T, Treasure J.

Table 2. AQ total and sub-scales scores among EDs and control parents

AQ scores, mean (SD)	EDs parents	Control parents	p
Total	16.10 (6.03)	18.09 (5.31)	.143
Social skills	2.85 (1.96)	2.88 (1.45)	.944
Attention switching	3.95 (1.92)	4.18 (1.78)	.597
Attention to detail	3.08 (2.15)	4.70 (2.32)	.003
Communication	2.48 (1.80)	3.00 (2.12)	.256
Imagination	3.75 (2.02)	3.33 (1.71)	.350

- Empathy, systemizing, and autistic traits in anorexia nervosa: a pilot study. *Br J Clin Psychol* 2008; 47: 335-9.
10. Huke V, Turk J, Kent A, Morgan JF. Autism spectrum disorders in eating disorder populations: a systematic review. *Eur Eat Disord Rev* 2013; 21: 345-51.
11. Baron-Cohen S, Jaffa T, Davies S, Auyeung B, Allison C, Wheelwright S. Do girls with anorexia nervosa have elevated autistic traits? *Mol Autism* 2013; 4: 24.
12. Gillberg CL. The Emanuel Miller Memorial Lecture, Autism and autistic-like conditions: subclasses among disorders of empathy. *J Child Psychol Psychiatry* 1992; 33: 813-42.
13. Koch SV, Larsen JT, Mouridsen, SE, et al. Autism spectrum disorder in individuals with anorexia nervosa and in their first- and second-degree relatives: Danish nationwide register-based cohort-study. *Br J Psychiatry* 2015; 206: 401-7.
14. Roberts ME, Tchanturia K, Treasure J. Is attention to detail a similarly strong candidate endophenotype for anorexia nervosa and bulimia nervosa? *World J Biol Psychiatry* 2013; 14: 452-63.
15. Anderluh MB, Tchanturia K, Rabe-Hesketh S, Treasure J. Childhood obsessive-compulsive personality traits in adult women with eating disorders: defining a broader eating disorder phenotype. *Am J Psychiatr* 2003; 160: 242-7.
16. American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-5™ (5th ed.). Arlington, VA: American Psychiatric Publishing, 2013.
17. Baron-Cohen S, Wheelwright S, Skinner R, Martin J, Clubley E. The autism spectrum quotient (AQ): evidence from Asperger syndrome/high functioning autism, males and females, scientists and mathematicians. *J Autism Dev Disord* 2001; 31: 5-17.
18. Wheelwright S, Auyeung B, Allison C, Baron-Cohen S. Research defining the broader, medium and narrow autism phenotype among parents using the Autism Spectrum Quotient (AQ). *Mol Autism* 2010; 1: 10.
19. Ruta L, Mazzone D, Mazzone L, Wheelwright S, Baron-Cohen S. The Autism-Spectrum Quotient-Italian version: a cross-cultural confirmation of the broader autism phenotype. *J Autism Dev Disord* 2012; 42: 625-33.
20. Beumont P, Al-Alami M, Touyz S. Relevance of a standard measurement of undernutrition to the diagnosis of anorexia nervosa: use of Quetelet's Body Mass Index (BMI). *Int J Eating Disord* 1988; 7: 399-405.
21. Prunas A, Sarno I, Preti E, Madeddu F, Perugini M. Psychometric properties of the Italian version of the SCL-90-R: a study on a large community sample. *Eur Psychiatry* 2012; 27: 591-7.
22. Della Sala S, MacPherson SE, Phillips L H, Sacco L, Spinnler H. How many camels are there in Italy? Cognitive estimates standardised on the Italian population. *Neurol Sci* 2003; 24: 10-5.
23. Dotti A, Lazzari R. Validation and reliability of the Italian EAT-26. *Eat Weight Disord* 1998; 3: 188-90.
24. Smolak L, Levine MP. Toward an integrated biopsychosocial model of eating disorders. In: *The Wiley Handbook of Eating Disorders*. Hoboken, New Jersey: Wiley-Blackwell, 2015.
25. Lopez CA, Tchanturia K, Stahl D, Treasure J. Central coherence in women with bulimia nervosa. *Int J Eating Disord* 2008; 41: 340-7.
26. Happe F, Frith U. The weak coherence account: detail-focused cognitive style in autism spectrum disorders. *J Autism Dev Disord* 2006; 36: 5-25.
27. Baron-Cohen S, Ashwin E, Ashwin C, Tavassoli T, Chakrabarti B. Talent in autism: hyper-systemizing, hyper-attention to detail and sensory hypersensitivity. *Philos Trans R Soc Lond B Biol Sci* 2009; 364: 1377-83.
28. Southgate L, Tchanturia K, Treasure J. Information processing bias in anorexia nervosa. *Psychiatry Res* 2008; 160: 221-7.
29. Gillberg IC, Rastam M, Wentz E, Gillberg C. Cognitive and executive functions in anorexia nervosa ten years after onset of eating disorder. *J Clin Exp Neuropsychol* 2007; 29: 170-8.
30. Lopez CA, Tchanturia K, Stahl D, et al. An examination of the concept of central coherence in women with anorexia nervosa. *Int J Eat Disord* 2008; 41: 143-52.
31. Chassler L. Understanding anorexia nervosa and bulimia nervosa from an attachment perspective. *Clin Soc Work J* 1997; 25: 407-23.
32. White HJ, Haycraft E, Madden S, et al. How do parents of adolescent patients with anorexia nervosa interact with their child at mealtimes? A study of parental strategies used in the family meal session of family-based treatment. *Int J Eating Disord* 2015; 48: 72-80.