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Restrictive eating disorders in adolescence: could family alliance affect the disease course? A clinical study on family dynamics for a more effective therapeutic approach.

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PhD dissertation of
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ORIGINAL PUBBLICATIONS

The present thesis is related to the following scientific works authored by the PhD candidate and colleagues. The contents of these contributions have been adapted to the purposes of the thesis.

Scientific Papers:

- **Mensi M.M.,** Criscuolo M., Vai E., Rogantini C., Orlandi M., Ballante E., Zanna V., Mazzoni S., Balottin U., Borgatti R. (2020). *Perceived and observed family functioning in adolescents affected by restrictive eating disorders*. Family relations (submitted 2020).

- **Mensi M.M.**, Rogantini C., Provenzi L., Borgatti R. *Family system approach to behavioral problems in anorexia nervosa: Exploring discordances between adolescent patients and parents.* Psychiatry Research (submitted 2020).

- Rogantini C., Provenzi L., **Mensi M.M**. *Prioritizing Family-Centered Mental Health Care for Pediatric Patients with Eating Disorders*. (2020) JAMA Pediatrics Online ahead of print.

- **Mensi M.M.**, Balottin L., Rogantini C., Orlandi M., Galvani M., Figini S., Chiappedi M., Balottin U. (2020). *Focus on family functioning in anorexia nervosa: new perspectives using the Lausanne Trilogue Play*. Psychiatry Research; Volume 288, 112968.

- **Mensi M.M.,** Rogantini C., Nacinovich R., Riva A., Provenzi L., Chiappedi M., Balottin U., Borgatti R. (2020). *Clinical features of adolescents diagnosed with eating disorders and at risk for psychosis*. European Psychiatry, 63(1), e80, 1–6.

- Balottin L., Mannarini S., **Mensi M.M**., Chiappedi M., Balottin U. (2018). *Are family relations connected to the quality of the outcome in adolescent anorexia nervosa? An observational study with the Lausanne Trilogue Play*. Clinical Psychology and Psychotherapy, 25(6); 785-796.

Posters and abstracts:

- **Mensi M.M.**, Antonaci E., Rogantini C., Orlandi M., Chiappedi M.A., Balottin U. "*Relazioni tra dinamiche familiari e profilo clinico e psicopatologico di pazienti con anoressia nervosa*" XXII Congresso Nazionale della Società Italiana di Psicopatologia (SOPSI). – Roma: Abstract - (02/2018)

- Rogantini C., Filosi E., Molteni S., Orlandi M., Vai E., Antonaci E., Balottin U., Chiappedi M.A., **Mensi M.M**. "*Lo stato mentale a rischio e relative correlazioni con la psicopatologia nei disturbi del comportamento alimentare*". 12a Edizione Congresso International Pathways of Psychiatry – Percorsi Integrati di Trattamento in Psichiatria – Roma. - (12/2019)

- Rogantini C., Filosi E., Molteni S., Orlandi M., Vai E., Antonaci E., Balottin U., Chiappedi M.A., **Mensi M.M**. "*Lo stato mentale a rischio nei disturbi del comportamento alimentare*". 30° Convegno Nazionale Società Italiana di Neuropsichiatria dell'Infanzia e della Adolescenza (SINPIA) – Bologna. (10/2019)

- Vai E., Rogantini C., Chiappedi M., Capone L., Antonaci E., Balottin U., **Mensi M.M**. "*Confronto tra funzionamento familiare percepito e funzionamento familiare osservato dal clinico in una casistica di pazienti adolescenti affette da disturbo del comportamento alimentare*". 30° Convegno Nazionale Società Italiana di Neuropsichiatria dell'Infanzia e della Adolescenza (SINPIA) – Bologna. (10/2019)

- **Mensi M.M.**, Criscuolo M., Vai E., Rogantini C., Chiappedi M.A., Ballante E., Zanna V., Mazzoni S., Balottin U., Borgatti R. "Comparison between perceived family functioning and family functioning observed by clinicians in adolescents affected by restrictive eating disorders" Congresso RIN (2020)

- **Mensi M.M.**, Rogantini C., Riva A., Provenzi L., Chiappedi A.M., Nacinovich R., Borgatti R. *"Caratteristiche cliniche di adolescenti affette da disturbi del comportamento alimentare e a rischio per psicosi"* XXV Congresso Nazionale della Società Italiana di Psicopatologia (SOPSI). – (accepted for 02/2021)

- **Mensi M.M**., Rogantini C., Orlandi M., Galvani M., Chiappedi M. A., Borgatti R. "*Funzionamento familiare: confronto tra famiglie di adolescenti affette da anoressia*

nervosa e gruppo di controllo. Nuove prospettive grazie all'utilizzo del Lausanne Trilogue Play clinico". XXV Congresso Nazionale della Società Italiana di Psicopatologia (SOPSI). – (accepted for 02/2021)

- **Mensi M.M**., Rogantini C., Provenzi L., Orlandi M., Coci C., Borgatti R. "*Approccio triadico ai problemi emotivo comportamentali in adolescenti affette da anoressia nervosa. Genitori vs pazienti: percezioni a confronto*" XXV Congresso Nazionale della Società Italiana di Psicopatologia (SOPSI) – (accepted for 02/2021)

This thesis work summarizes the published / submitted and unpublished works related to the PhD project and carried out between 2017 and 2020.

Dedicated to

my husband Marco

and

my beloved son Manfredi

Summary of the present work

This thesis project stems from the desire to deepen clinical research in the field of restrictive eating disorders. These disorders typically start in adolescence, are burdened by a high percentage of comorbidities, their prognosis often involves chronicity or a long course before the symptoms are remedied and are associated with a high mortality rate both because of suicide and because the state of health is concretely jeopardised by external events, even trivial ones, which end up playing a precipitating role on a physical condition at serious risk of breakdown (e.g., due to heart problems). The project included girls aged between 11 and 18 years, diagnosed according to DSM 5 with: avoidant/restrictive eating disorder, anorexia nervosa, atypical anorexia nervosa or NAS restrictive eating disorder.

Patients were recruited in a third level centre in different treatment settings: specialist outpatient clinic for (Restrictive Eating Disorders) REDs, rehabilitation Day Hospital or diagnostic and rehabilitation inpatient.

This type of recruitment allowed us to focus on the most serious patients, both on the physical and psychiatric side, with respect to the wide spectrum in which these pathologies can manifest themselves. In this regard, we investigated by means of a semi-structured Comprehensive Assessment of At-Risk Mental States (CAARMS) interview (Fusar-Poli et al., 2012; Yung et al., 2005) the presence in our sample of comorbidities with frank or subthreshold psychotic symptoms. 4% of our patients exceeded the threshold for psychosis and 84% presented psychotic symptoms attenuated in intensity or frequency represented mainly by visual, somatic, and auditory disturbances. Focusing on at-risk patients, it emerged that they more often have impulsive and elimination behaviours and, in general, greater emotional and behavioural dyscontrol; the same patients acknowledged more than the others a more impaired functioning, with lower social and school performance.

It was therefore interesting to investigate how the behavioural problems were perceived by the family and whether there were any discrepancies within the triad in this regard. We therefore used the Youth Self-Report questionnaire (Achenbach,

1991b) for the patients and the Child Behavior Check-List (Achenbach, 1991a) for mother and father. Internalising disorders were confirmed as the major comorbidity in line with the international literature.

Mother and father showed no significant differences in their views regarding the perception of internalising, externalising and total problems. Significant triadic differences emerged for specific behavioural problems, i.e., somatic complaints, thinking problems, and oppositional behaviour, all of which were perceived as less intense by the patients. We believe that focusing on these specific and different aspects can help the clinician in a triadic therapeutic perspective, in order to work both on the different perceptions and dysfunctional behaviours of patients and to provide a specific focus on these problems in the context of family therapy.

The interest in triadic and family dynamics was the focus of the thesis work.
The potential role of family factors was confirmed both with regard to the pathogenetic and maintenance mechanism of the disorder and as a pivotal point with regard to effective treatment strategies for patients with anorexia nervosa (Anastasiadou D., 2014; Lock J., 2015; Lyke, 2013).
By means of the Lausanne Triadic Play clinical version (LTPc) instrument (M. Malagoli Togliatti, 2006) we were able to better investigate (through a case-control study) what had already emerged from previous works with respect to the presence of dysfunctional family dynamics in restrictive eating disorders. In particular, as far as functional levels are concerned, a fragility emerged especially in participation and organisation, which represent the availability (with the body) to the relationship and the correct maintenance of the role function. Considering the four phases of the test, low (dysfunctional) scores were found both in the dyadic and triadic phases and in the couple phase, with the latter two being more compromised.

It therefore seemed interesting to assess whether or not these difficulties were also perceived by the parents. To this end, we used the FACES-IV instrument (Olson & Gorall, 2006) compiled by the mother and father to investigate their perception of family functioning and their degree of agreement on the subject. We found general agreement between the parents on the FACES-IV sub-scales and also recognised a typical pattern of family functioning that the parents described as generally functional. This finding stands in stark contrast to the clinicians' LTPc finding of

predominantly collusive family alliances suggesting the use of both self-report and observational instruments in assessing the family functioning of patients with restrictive eating disorders. The self-report questionnaire can be considered as an important starting point during the treatment allowing to discuss with the parent the possible discrepancy with the clinician's observational tools to facilitate the understanding of the real difficulties that afflict the family, in order to modify and improve family functioning.

Having ascertained the importance of the LTPc as an evaluation and therapeutic tool for this pathology, we wondered about its prognostic value with respect to follow-up. To this end, the MROAS scale (Morgan & Hayward, 1988) adapted for adolescents by Jeammet et al. (1991) was used to assess the clinical progress of patients at 6 months after the start of the intervention. This study showed that the triadic relational skills displayed by the girls within the family were associated with a positive prognosis and greater sensitivity to therapy.

Finally, the LTPc proved to be a useful tool to orient the therapeutic proposal thanks to the detection of different family configurations. We believe that, considering the different evolutionary trajectories of patients with this disorder, for some of them it is essential to work on the triad while for others it is important to have a space for individual psychotherapy and a separate space for parents to focus on the separation-individuation process.

From this point of view, a therapeutic proposal that guarantees three different settings: individual therapy, support to the parental role and triadic intervention could meet the needs of all patients and offer the most complete care possible, especially in the initial phase of treatment of the most serious patients.
We therefore structured a model of intervention for patients attending our third level centre with severe restrictive eating disorder that would include, in addition to the usual treatment of nutritional rehabilitation and psychiatric rehabilitation, for 6 months of treatment

- individual psychodynamic psychotherapy on a weekly basis (Fitzpatrick et al., 2010);
- fortnightly parental couple support (Hughes et al., 2015; Duclos et al., 2018)
- fortnightly family (triadic) therapy (Godart et al., 2012).

The assessment of family dynamics using LTPc was repeated pre- and post-intervention in 18 families who agreed to participate in the research project.

The results document a significant change in scores (corresponding to better functioning) only in the dyadic phase corresponding to the patient's interaction with her father. This finding is in line with the hypothesis that fathers usually assume a disengaged role compared to mothers who are, on the contrary, hyperinvolved. Our intervention could therefore have favoured a greater investment of fathers in the relationship with their daughters and a greater ability of mothers to leave space for their spouse. In particular, it seems to emerge from the study that it is the paternal warmth that is fundamental to improve the interaction. This finding was already known in the literature as being correlated with outcome; for this reason, it seems crucial to us that fathers who remain emotionally and concretely excluded are encouraged and supported (Godart et al., 2012; Couturier et al., 2013; Hay et. al., 2014; Horesh et al., 2015).

We did not find a similar change regarding mothers after treatment. As pointed out by previous studies (Kyriacou et al., 2008; Whitney et al., 2012; Anastasiadou et al., 2014), mothers are usually more involved in their daughters' pathology than fathers who are more critical; therefore, it can be assumed that mothers must need a more prolonged treatment to modify these dysfunctional patterns.

Similarly, we did not find changes in the triadic phase probably due to the short duration of our intervention, although intensive.

In conclusion, we can hypothesise that our family intervention model nevertheless changed the developmental trajectory of each family and this finding leads us to reiterate the importance of a family, multi-professional and integrated intake in the treatment of restrictive eating disorders, especially if of severe level (Couturier et al., 2013; Fisher et al., 2019).

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1. Restrictive eating disorders in adolescence

Restrictive Eating disorders (REDs) are a heterogeneous group of potentially severe pathological conditions, associated with moderate to high levels of psychosocial and work impairment (Hay et al., 2017). Anorexia nervosa is the most studied and best-known eating disorder; it usually develops during adolescence.

REDs have shown over the last years increased **incidence** among young people, especially in the high risk-group of 15–19 year old girls (Hoek, 2016; Keski-Rahkonen & Mustelin, 2016; Smink et al., 2012). A recent systematic review reported weighted population means (and ranges) of lifetime prevalence as 1.4% (0.1–3.6%) for women and 0.2% (0–0.3%) for men (Galmiche et al., 2019). Partial syndromes and subclinical anorexia nervosa are instead much more frequent, suggesting a **prevalence** between 2.4 and 4.3% (Jagielska & Kacperska, 2017). What is more, studies suggest a community wide increase in AN over the time, especially in women and young people (Hoek, 2016; Keski-Rahkonen & Mustelin, 2016).

The current scientific view about the **etiology** of REDs is multi-factorial: the development of these pathologies depends on the presence of an individual vulnerability, mainly expressed during adolescence, combined with specific biological, psychological, environmental, family, socio-cultural risk factors (Dell'Osso et al., 2016; Gutiérrez et al., 2015; Lock & La Via, 2015; National Collaborating Centre for Mental Health (UK), 2004; Rikani et al., 2013).

Diagnostic criteria

In this work, we consider the restrictive eating disorders among which we include, in accordance with the DSM-5 criteria (American Psychiatric Association, 2013):

ANOREXIA NERVOSA:

A. Restriction of energy intake relative to requirements, leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health. Significantly low weight is defined as a weight that is less than minimally normal or, for children and adolescents, less than that minimally expected.

B. Intense fear of gaining weight or of becoming fat, or persistent behavior that interferes with weight gain, even though at a significantly low weight.

C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight.

Specify whether:

Restricting type: During the last 3 months, the individual has not engaged in recurrent episodes of binge eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas). This subtype describes presentations in which weight loss is accomplished primarily through dieting, fasting, and/or excessive exercise.

Binge-eating/purging type: During the last 3 months, the individual has engaged in recurrent episodes of binge eating or purging behavior (i.e., self-induced vomiting or the misuse of laxatives, diuretics, or enemas).

Specify if:

In partial remission: After full criteria for anorexia nervosa were previously met. Criterion A (low body weight) has not been met for a sustained period, but either Criterion B (intense fear of gaining weight or becoming fat or behavior that interferes with weight gain) or Criterion C (disturbances in self-perception of weight and shape) is still met.

In full remission: After full criteria for anorexia nervosa were previously met, none of the criteria have been met for a sustained period of time.

Specify current severity:

The minimum level of severity is based, for adults, on current body mass index (BMI) (see below) or, for children and adolescents, on BMI percentile. The ranges below are derived from World Health Organization categories for thinness in adults; for children and adolescents, corresponding BMI percentiles should be used. The level of severity may be increased to reflect clinical symptoms, the degree of functional disability, and the need for supervision.

Mild: BMI ≥ 17kg/ m^2

Moderate: BMI 16-16.99 kg/m^2

Severe: BMI 15-15.99 kg/ m^2

Extreme: BMI < 15 kg/ m^2

ATYPICAL ANOREXIA NERVOSA: All of the criteria for anorexia nervosa are met, except that despite significant weight loss, the individual's weight is within or above the normal range.

AVOIDANT/RESTRICTIVE FOOD INTAKE DISORDER:

A. An eating or feeding disturbance (e.g., apparent lack of interest in eating or food; avoidance based on the sensory characteristics of food; concern about aversive consequences of eating) as manifested by persistent failure to meet appropriate nutritional and/or energy needs associated with one (or more) of the following:

1) Significant weight loss (or failure to achieve expected weight gain or faltering growth in children).
2) Significant nutritional deficiency.
3) Dependence on enteral feeding or oral nutritional supplements.
4) Marked interference with psychosocial functioning.

B. The disturbance is not better explained by lack of available food or by an associated culturally sanctioned practice.

C. The eating disturbance does not occur exclusively during the course of anorexia nervosa or bulimia nervosa, and there is no evidence of a disturbance in the way in which one's body weight or shape is experienced.

D. The eating disturbance is not attributable to a concurrent medical condition or not better explained by another mental disorder. When the eating disturbance occurs in the context of another condition or disorder, the severity of the eating disturbance exceeds that routinely associated with the condition or disorder and warrants additional clinical attention.

Specify if: In remission: After full criteria for avoidant/restrictive food intake disorder were previously met, the criteria have not been met for a sustained period of time.

EATING DISORDER NOT OTHERWISE SPECIFIED WITH RESTRICTIVE CHARACTERISTICS: This category applies to presentations in which symptoms characteristic of a feeding and eating disorder that cause clinically significant distress or impairment in social, occupational, or other important areas of functioning predominate but do not meet the full criteria for any of the disorders in the feeding and eating disorders diagnostic class. The unspecified feeding and eating disorder category is used in situations in which the clinician chooses not to specify the reason that the criteria are not met for a specific feeding and eating disorder, and includes presentations in which there is insufficient information to make a more specific diagnosis (e.g., in emergency room settings).

REDs are associated with a high **comorbidity**. Micali et al. (2015) indicated that comorbidity is a common problem during the acute phase of the illness. A 2-year follow-up of adolescents aged 14 and 16 meeting the DSM-5 criteria for AN showed an increased risk of depressive and anxiety disorders.

Additional psychiatric disorders are more likely to occur in those still affected: two thirds of patients with a persistent eating disorder had at least one other psychiatric disorder. A meta-analysis of studies published in the second half of the 20th century (Steinhausen, 2002) in a cohort of AN patients indicated that:

- affective disorders occurred in 24.1%±16.3% (2–67%),
- neurotic or anxiety disorders in 25.5%±14.9% (4–61%),
- obsessive-compulsive disorders in 12%±6.4% (0–23%),
- personality disorders: 16.6%±19.9% (0–53%) of patients had a histrionic personality disorder, and 17.4%±16.8% (0–69%) of patients had other personality disorders including borderline states
- substance abuse disorder in 14.6%±10.4% (2–38%), and
- schizophrenia in 4.6%±5.7% (1–28%).

An 18-year follow-up of patients with adolescent-onset AN versus the control group also showed the proportion of patients with at least one additional psychiatric disorder to be over two times higher than in the control group (39% vs. 16%, respectively) (Halvorsen et al., 2004).

Additional psychiatric disorders are more common in patients with binge-eating/ purging subtype of AN. Fichter et al. (2006) conducted a 12-year follow-up of adolescents and adults with a history of hospital treatment, including a high rate of patients with binge-eating/purging type of AN. The study showed the presence of psychiatric disorders in as many as 76.6% of patients.

This illness is likely to have a very severe **prognosis**, with a percentage of mortality around 1.8% in patients with onset within 18 years (with a fifth of them being suicidal deaths) (Arcelus et al., 2011), that climbs to 5.9% in an unrestricted patient sample (Steinhausen, 2009). The mortality ratio increases by 5.6% per decade of illness duration (Herzog et al., 1996; Steinhausen, 2009; Sullivan, 1995).

Moreover the **chronicization** rate is high, with a minimum of 16.9% in less severely ill patients with a relatively short illness duration (Steinhausen, 2009).

Many studies show a high risk of developing other psychiatric disorders during the patients' lifetime, even after recovery from AN (Jagielska & Kacperska, 2017): one third of those who stopped meeting eating disorder criteria had at least one other psychiatric disorder (Halvorsen et al., 2004).

Sixteen years after the beginning of treatment (when 85.3% of patients no longer had AN symptoms and 68% of patients — no eating disorders) 37% of patients continued to have symptoms of various psychiatric disorders (which did not disturb the patients' functioning in most cases), including most frequently symptoms of depression (56%), anxiety disorders (28%), and obsessive-compulsive disorders (12%) (Nilsson & Hägglöf, 2005).

Another study with good treatment results (82% of patients in remission) after a 3.5–14.5-year follow-up showed at least one axis I psychiatric disorder (according to DSM-IV) in 41% of patients (most commonly a depressive or anxiety disorder), with 10% of patients exhibiting symptoms of post-traumatic stress disorder (PTSD). At the end of the follow-up period, 55% of patients exhibited eating disorders or other psychiatric disorders (Halvorsen et al., 2004).

The massive extent of these disturbs on the health status of individuals has ensured that the World Health Organization includes EDs among the priority mental illnesses of children and adolescents, highlighting the importance of an early therapeutic intervention (Janet Treasure et al., 2010).

Therefore, the management of the early stages of the disorder's development seems crucial in order to prevent the most negative outcomes.

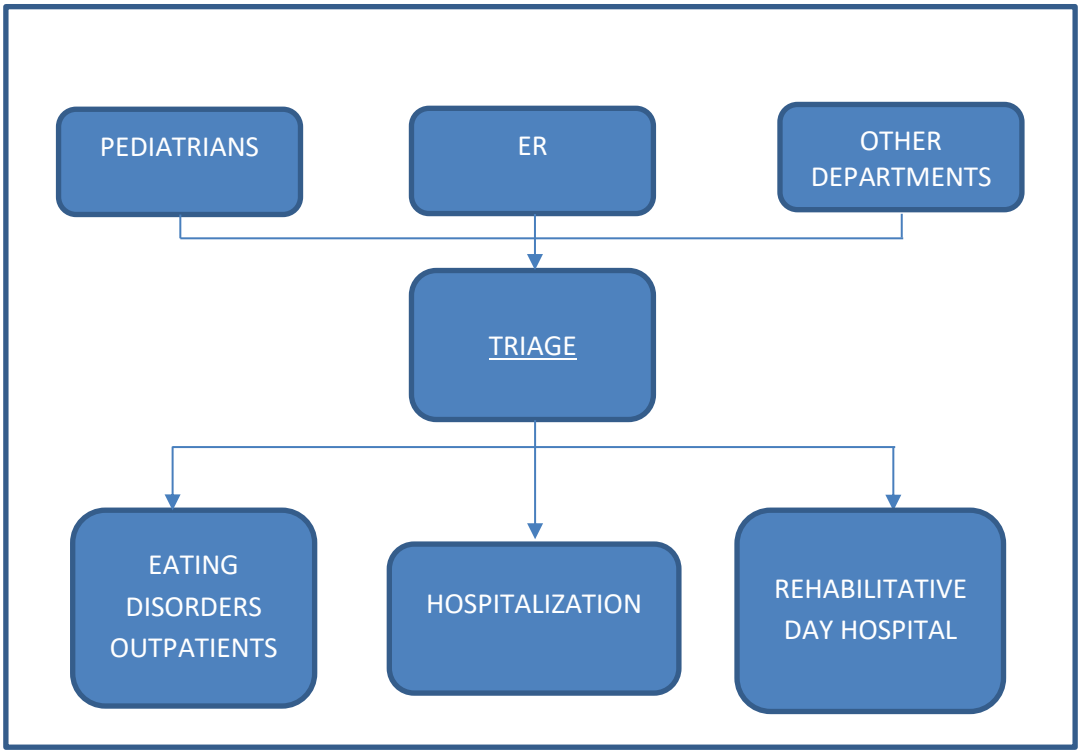
1.1 Clinical features of adolescents diagnosed with eating disorders in a tertiary care service

In our centre families come from different senders. Rarely the patients arrive through our clinic with a request for a first visit, more often the paediatricians send them with an urgent first visit or it is the first aid or other departments to call us to ask for a transfer to our hospital.

This is because our department is part of a third level centre and operates in a suprazonal way.

As a result, patients in our facility are often particularly severe.

In the figure below, the flow chart for admission to our unit.



Our clinical evidence suggests a frequent overlap in this type of patients between eating disorders and psychosis, in particular we find ourselves in front of psychotic symptoms presented in attenuated forms.

In line with this fact, it is possible to consider eating disorders—and especially anorexia nervosa—as characterized by the intense fear (anxiety) of fattening and delusional beliefs

about food, as well as the presence of a distortion of the body image (dysmorphophobia) (Delsedime et al., 2013; Sarró, 2009).

In a recent study, Solmi and colleagues (2018) reported on the significant association between psychotic experiences and eating disorders in a cohort of adolescents, suggesting that psychotic symptoms may be considered as markers of increased risk for more severe psychopathology in late adolescence.

The co-occurrence or comorbidity between eating disorders and psychosis is far less investigated, especially in children and adolescents, as findings mostly refer to sporadic adult clinical cases (Delsedime et al., 2013; Sarró, 2009; Seeman, 2014) which prevent definitive conclusions from being drawn (Solmi et al., 2018).

This lack of knowledge is quite surprising. Precocious screening and identification of those who are at risk for full-blown as well as for attenuated forms of psychosis is a priority goal in psychiatric practice with adolescent patients. Additionally, subjects with attenuated forms of psychosis have been found to have a 30% higher probability of developing full-blown psychosis (e.g., schizophrenia) in the following 2 years (Fusar-Poli et al., 2012), and they may show reduced response to treatments, especially during adolescence (Hazan et al., 2020; Solmi et al., 2018). Both a recent large cohort study of more than 6,000 patients (Solmi et al., 2019) and a systematic review of the literature support the hypothesis that eating disorders and psychosis share genetic liability and common phenotypic risk factors.

The present study

(*Mensi et al., Clinical features of adolescents diagnosed with eating disorders and at risk for psychosis. European Psychiatry, 2020*)

The present study aimed at providing a detailed characterization of adolescent patients diagnosed with eating disorders in the absence or presence of psychotic symptoms, taking into consideration a wide set of sociodemographic, psychological, and clinical variables.

The specific goals were:

1. to assess the psychological functioning and the severity of the eating disorder in adolescents with or without psychotic symptoms

2. to explore the associations between neonatal, sociodemographic, clinical, and psychological functioning variables with eating disorders severity in the two groups.

Materials and methods

Participants were ninety-four adolescent patients diagnosed with eating disorders who access to third level hospital units: 11 subjects were outpatients, 18 were in day hospital, and 65 were hospitalized.

All patients carried out a semi-structured interview to fill in the Comprehensive Assessment of At-Risk Mental States (CAARMS) (Fusar-Poli et al., 2012; Yung et al., 2005) that provides a quantitative index of risk for full-blown and attenuated psychosis in psychiatric patients. A score for attenuated positive psychotic symptoms is obtained by summing up the points scored in the first three subscales. According to the CAARMS, the sample was split into two groups: no psychotic risk (HR−) and psychotic risk (HR+).

Results and Discussion

Among the 94 adolescents included in the study, four (4%) had a diagnosis of full-blown psychosis, while 15 patients were HR−. Attenuated psychotic symptoms appeared to be highly frequent in the subjects with eating disorders enrolled in our study: in fact, they were present in 79 out of 94 adolescents (84%). This finding is consistent with previous research suggesting that the comorbidity between psychosis and eating disorders may be at least partially due to overlapping common psychological processes distorting reality perceptions that are common of anorexia nervosa and psychotic symptoms (Miotto et al., 2010) especially in the most severe patients.

Distortions of body image are among the most common psychotic symptoms reported in association with eating disorders (Stewart & Williamson, 2003; Zaider et al., 2000). These symptoms are described in previous reports on adult population as the most pervasive, the first that occur (about 6 months before the diagnosis) and the most difficult to treat (Lena et al., 2004; Stewart & Williamson, 2003).

Moreover, we found that impulsive behaviour (e.g., purging acts) and impulsivity were much more frequent among at-risk patients. We hypothesize that the described impulsiveness of

subjects at risk of psychosis, together with a fragility of thought organization, leads to a greater behavioural discontrol, which is observed in terms of greater purging behaviours frequency in these patients.

Patients with psychotic symptoms also reported a higher proportion of poor academic achievements and school withdrawal. Previous research suggests that adolescents with problems in body image and disordered eating behaviour are at higher risk for academic interference and lower grade point average (Yanover & Thompson, 2008) and in general, with school maladjustment. The present findings suggest that the comorbid presentation with subthreshold psychotic symptoms may further exacerbate the risk of academic failure and school withdrawal.

Higher eating disorders' severity emerged for patients at risk for psychosis, especially in presence of low BMI. This finding further suggests the presence of a link between the severity of the eating disorder and the risk of psychotic subthreshold features.

Notably, a significant association between the severity and global social functioning emerged in patients without risk of psychosis but not in at-risk subjects. We speculate that in the presence of subthreshold psychotic symptomatology, the overall psychological functioning—including relational, social, and school adaptation—is probably much more affected by the frequency and the intensity of psychotic symptoms rather than by features specific of eating disorders (Denenny et al., 2015).

Specific psychological symptoms emerged associated with risk of psychosis in patients with eating disorders. This symptom constellation was characterized by more severe self-perceived ineffectiveness, interpersonal, and affective problems. As such, it could be hypothesized that the attenuated psychotic symptoms observed in a wide proportion of patients with eating disorders may be a proxy of the psychopathological severity and complexity of the eating disorder (e.g., multiple comorbidities, worse overall functioning).

Conclusions

To the best of our knowledge, this investigation provided for the first time in literature an overall picture of the specificity of eating disorders conditions in the absence or presence of psychosis risk.

The findings of the present work described a potential multidimensional psychotic core, concerning body image and weight as well as psychological characteristics that can have relevant implications for clinical practice with adolescents with eating disorders.

First, the availability of reliable and valid markers of risk can further increase our capacity to detect early emergence of psychosis in adolescents with eating disorders. This study highlights specific dimensions of psychological functioning that can be easily detected by the clinician during anamnestic interviews. More specifically, the present study confirmed that the CAARMS should be regarded as a tool of relevant clinical utility for identifying prodromal psychotic symptoms even in adolescents with eating disorders (Spada et al., 2016). We strongly suggest including CAARMS interview into the ordinary diagnostic assessment of eating disorders. Second, this study may be considered as a first step forward to identify specific psychological dimensions (i.e., inadequacy feelings, interpersonal, and affective regulation problems) that can be the focus of preventive and early intervention strategies.

2. A triadic approach to emotional and behavioral problems

It is widely known that patients with eating disorders (ED) have a high rate of comorbid psychiatric disorders, ranging from 45 to 97% of subjects with anorexia nervosa (AN) (Herpertz-Dahlmann, 2015). Previous studies highlighted that internalizing behavioural problems are among the most frequent comorbidities, including the presence of thought problems (Fennig et al., 2017; Muratori et al., 2004) and somatic complaints (Wentz et al., 2007) that may exacerbate the risk of depressive and anxiety disorders (Criscuolo et al., 2020; Stice et al., 2001; Zaider et al., 2000).

When assessing the presence of behavioural problems in adolescents with psychiatric illness and psychopathology, multi-informant approaches should be considered as they can provide a multifaceted view of to help clinicians in decision-making and treatment planning (Comer & Kendall, 2004). There is a substantial amount of literature that provided multi-informant assessment of behavioural problems in healthy (Janssen et al., 2004; Van der Ende et al., 2012) and at-risk (Rodríguez Martín et al., 2004; Salbach-Andrae et al., 2008) adolescents. For instance, Van der Ende and colleagues (2012) determined agreement among the reports of adolescent problem behaviour by parents and adolescents themselves. Discrepancies emerged with adolescents reporting higher levels of problems than parents for all types of behaviour; as such, the authors suggested that information from multiple informants is needed in order to obtain a complete view on adolescents' problem behaviours. Moreover, Rodríguez Martín and colleagues (2004) examined clinically relevant patterns of agreement between parent and at-risk adolescents' ratings of adolescent behavioural problems, by means of self-reported questionnaires. Overall agreement between parent-adolescent ratings was modest, confirming the need of a multi-informant approach.

Obtaining independent information from adolescents with ED and their parents is warranted to highlight potential areas of interpersonal family conflicts that may dramatically affect the daily quality of life of the patients and their primary caregivers (Cerniglia et al., 2017). Salbach-Andrae and colleagues (2008) reported higher scores in parent-reported internalizing problems (e.g., somatic complaints) compared to scores obtained by their daughters. Although this study preliminary suggested the presence of discrepancies in the perception of behavioural problems between adolescents with ED and their parents, the authors did not assess separately the reports of mothers and fathers. Additionally, there was

no exploration of factors that may affect this discrepancy. Noteworthy, the study from Salbach-Andrae and collaborators (2008) has never been replicated. As such, the presence of paternal and maternal discrepancies with respect to adolescents' ratings of their own behavioural problems, as well as the study of the role played by physical characteristics (e.g., weight and menarche), associated symptoms (e.g., restrictive or purging behaviour) and psycho-social factors in these discrepancies remain greatly unexplored. Notably, the investigation of these aspects is warranted to increase our comprehension of behavioural problems in adolescents with ED and may provide clinicians with a more accurate and complete framework to interpret them in family consultation sessions and clinical practice (De Los Reyes et al., 2013).

The present study

(*M.M. Mensi et al., Family system approach to behavioral problems in anorexia nervosa: Exploring discordances between adolescent patients and parents, Psychiatry Research (submitted) 2020*)

The specific goals were:

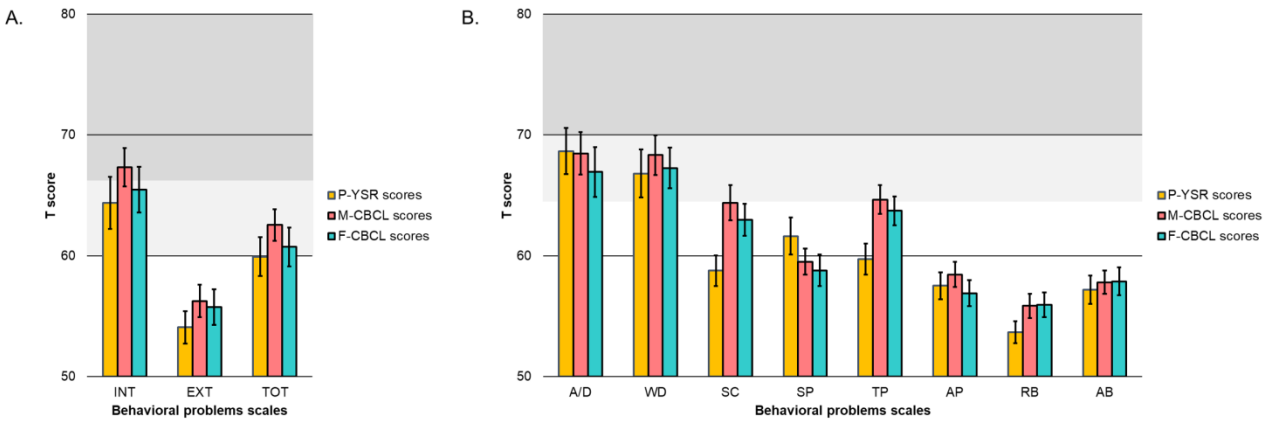
1. the main goal was to assess from a triadic family-centred perspective the potential discrepancies in the perception of behavioural problems among patients with ED, their mothers, and their fathers.
2. the second exploratory goal was to investigate the relative role played by physical characteristics, ED-associated symptoms, and psychosocial factors in contributing to triadic discrepancies in the perception of the young patients' behavioural problems.

Materials and Methods

We enrolled 48 female adolescent patients diagnosed with restrictive ED (according to diagnostic Statistical Manual - DSM-5) and age between 11 and 18 years with their mothers and fathers. In order to measure perceptions of behavioural problems in the family members, adolescent patients were asked to fill in the self-report Youth Self-Report (Achenbach, 1991b), whereas mothers and fathers were asked to fill separately the Child Behavior Check-List (Achenbach, 1991a).

Results and Discussion

Internalizing behaviours emerged as the most frequent problems reported by all the family members. No significant differences emerged between mothers and fathers for internalizing, externalizing and total behavioural problem scores.



P-YSR, M-CBCL and F-CBCL behavioral problems scores for (A) core dimensions and (B) subscales.

P-YSR, Patients' Youth Self-Report; M-CBCL, Mother-reported Child Behavior Check List; F-CBCL, Father-reported Child Behavior Check List; INT, Internalizing problems; EXT, Externalizing problems; TOT, Total problems; A/D, Anxious/depressed; WD, Withdrawal; SC, Somatic complaints; SP, Social problems; TP, Thought problems; AP, Attention problems; RB, Rule-breaking behaviors; AB, Aggressive behaviors. Bars represent standard errors. In the background: white represents absence of behavioral problems; light grey represents risk of behavioral problems; dark grey represents presence of behavioral problems.

A trend to significance only emerged for the comparison between mothers and patients' scores for internalizing and externalizing behavioural problems (INT, $t(41) = 1.95$, $p = .058$, EXT, $t(41) = 1.92$, $p = .062$, and TOT, $t(41) = 1.99$, $p = .054$). This trend suggests that specific problematic behaviours, rather than the overall amount of behavioural problems, may result in different perceptions of relational and psychological difficulties among family members.

Indeed, significant triadic differences emerged for specific behavioural problems, i.e., somatic complaints (SC, $F(2,82) = 10.68$, $p < .001$, $\eta 2p = .21$), thought problems (TP, $F(2,82) = 7.08$, $p < .001$, $\eta 2p = .15$) and rule-breaking behaviours (RB, $F(2,82) = 6.27$, $p = .003$, $\eta 2p = .13$) for which patient-reported scores were significantly lower than parent-reported ones (mother-reported ones: $3.75 < ts < 5.08$, $ps < .001$; father-reported ones: $2.65 < ts < 3.25$, $ps \leq .01$).

First, patients reported lower scores for the somatic complaints subscale compared to both parents. Patients with ED may deny or even lack an integrated perception of bodily painful sensations and suffering especially in the initial phase of the disorder (Ekeroth et al., 2003; Salbach-Andrae et al., 2009; Viglione et al., 2006). Additionally, contrary to their parents'

perception, adolescents with ED may consider specific psychosomatic symptoms as essentially ego-syntonic (Gregertsen et al., 2017), thus reducing the possibility that they report them as a problematic feature having a negative impact on their daily quality of life.

Patients also reported lower scores for thought problems compared to their parents. Patients may struggle to recognize some core aspects of ED related to thought disturbances (e.g., dysmorphophobia or bluntly obsessive food patterns) whereas their parents, as external observers, may recognize them more easily as pathological symptoms (Becker et al., 2004; Berg-Nielsen et al., 2003). Finally, patients reported lower scores in rule-breaking behaviours compared to their parents' ratings. The items in the rule-breaking behaviours subscale describe behaviours such as disrupting daily family rules (e.g., the rule of eating together) and addiction-like behaviours (e.g., the compulsive nature of restrictive conducts). While adolescents with ED may perceive these pathological behaviours as normal habits needed to control caloric intake and body shape, the parents may have a different view based on their educational perspective and rule-setting role.

In the light of the above, we explored contributors to the aforementioned discrepancies between parental and patients' perception of behavioural problems. Specific physical (i.e., menstrual cycle and weight), disease-related (i.e., purging behaviours, dysmorphophobia) and psychosocial (i.e., school failure) factors emerged as significant contributors to these discrepancies. A schematic overview of the associations of eating disorders features and psychosocial problems with patients (P-YSR), mothers (M-CBCL) and fathers (F-CBCL) scores of subscales Somatic complaints (SC), Thought problems (TP), and Rule-breaking Behaviours (RB) is reported in the figure above.

A.	**SC**			**TP**			**RB**		
Physical variables	**P-YSR**	**M-CBCL**	**F-CBCL**	**P-YSR**	**M-CBCL**	**F-CBCL**	**P-YSR**	**M-CBCL**	**F-CBCL**
Menarche	↓	X	X	X	X	X	X	X	X
Irregular period	X	↑	X	X	X	X	X	X	X

B.	**SC**			**TP**			**RB**		
Eating disorders features	**P-YSR**	**M-CBCL**	**F-CBCL**	**P-YSR**	**M-CBCL**	**F-CBCL**	**P-YSR**	**M-CBCL**	**F-CBCL**
Purging behaviours	↑	↑	↑	↑	X	↑	X	↑	↑
Binge eating	↑	↑	↑	X	X	X	↑	↑	↑
Dysmorphophobia	X	X	X	X	X	↑	X	X	X
Obsessive-compulsive acts	X	X	X	X	X	X	X	X	X
Hyperactive attitude	X	X	X	X	X	X	X	X	X

C.	**SC**			**TP**			**RB**		
Psycho-social problems	**P-YSR**	**M-CBCL**	**F-CBCL**	**P-YSR**	**M-CBCL**	**F-CBCL**	**P-YSR**	**M-CBCL**	**F-CBCL**
Risky behaviors	↑	↑	↑	↑	↑	↑	↑	↑	↑
Social inhibition	X	X	X	X	X	X	X	X	X
School retreat	↑	↑	↑	↑	X	↑	X	↑	↑

Note. Green down-faced arrow, statistically significant negative effect; Green up-faced arrow, statistically significant positive effect; Red cross, statistically non-significant effect.

Among physical variables, menarche and the menstrual cycle were associated with significant differences between somatic complaints scores reported by patients and their mothers. The adolescents with irregular menstrual cycle reported lower scores in this subscale, in respect to their mothers' ones ($t(40) = -2.49$, $p = .035$). From the mother's point of view, the presence of the menstrual cycle conveys a sense of normal growth, consequently perceived as more developmentally mature and feminine (Usmiani & Daniluk, 1997). On the contrary, the presence of the menstrual cycle may be lived as a painful experience by the patients themselves, probably because of a challenging integration of the emerging changes in their body with the emerging somatic and psychological identity (Jappe & Gardner, 2009). As such, our results indirectly corroborate the evidence of a complex relationship between physical maturation and mother/daughter dynamics in contributing to the development of a positive body image for adolescent girls (Boehm et al., 2016; Usmiani & Daniluk, 1997).

Parents of girls with greater weight reported higher scores for rule-breaking behaviours (M-CBCL: $r = .59$, $p < .001$; F-CBCL $r = .38$, $p = .025$). As the patients gain weight, the themes around which family members live emotional conflicts may move from the adequacy of weight (Shrewsbury et al., 2010) to other topics, such as the impact of rule-breaking behaviours in daily family life.

The presence of purging behaviours (e.g., self-induced vomiting) was also linked with higher parent-reported rule-breaking behaviours scores, but not with patient scores for the same subscale (M-CBCL: $t(40) = 2.47$, $p = .018$, $d = .84$; F-CBCL: $t(40) = 2.14$, $p = .038$, $d = .75$). According to previous qualitative studies, adolescents may rather perceive these compulsive behaviours as attempts to cope and dampen the negative emotions elicited by food and eating (McNamara et al., 2008) and not as rule-breaking. Notably, the scores reported by daughters and fathers and in the thought problems subscale were higher in presence of purging behaviours (P-CBCL: $t(40) = 2.81$, $p = .008$, $d = .86$, F-CBCL: $t(40) = 2.45$, $p = .019$, $d = .91$). Similarly, the presence of dysmorphophobia significantly associated with heightened scores of thought problems in the fathers' CBCL ($t(40) = 3.16$, $p = .003$, $d = 1.18$). Taken together, these findings appear to suggest that fathers may play a critical – yet underestimated – role in the healthcare journey of patients with ED (Balottin et al., 2017).

Among psychosocial factors, school failure was significantly associated with greater thought problems scores reported by patients and their fathers (P-CBCL: t(40) = 2.18, p = .036, d = .78; F-CBCL t(40) = 2.23, p = .031, d .92). Moreover, it was also linked to greater differences between the scores for rule-breaking behavioural problems reported by the patients' and both their parents (M-CBCL: t(40) = 2.32, p = .026, d = .81, F-CBCL: t(40) = 2.70, p = .010, d .92). On the one hand, this further confirms that father may be an underestimated ally for patients in family therapies, as his active engagement may promote overall family members' awareness of the emotional world of the patient (e.g., by considering potential school problems and breakdown as by-product of psychological sufferance and thought disturbances (Stice et al., 2001). On the other hand, clinical practice suggests that mothers of adolescents with ED may highly invest in the academic and performance-related success of their daughters, so that school failure may be perceived by them as an aggressive and provocative act that violates the rule of adherence to maternal expectations (Campos et al., 2012).

Conclusions

The results of our study suggest only a partial agreement between the members of the triad, regarding the evaluation of comorbidities. Discrepancies regarded the perception of specific problems and also potential physical, disease-related and psychosocial variables that could exacerbate these differences. The implication of these findings is noteworthy. In fact, we believe that focusing on these specific and different aspects (physical, psychosocial, behavioural) can help the clinician in a therapeutic perspective that takes charge of the family, in order to work on the different perceptions about problematic patients' behaviours. Providing a specific focus on these issues in the context of family therapy with EDs patients and their parents, in addition to the focus on eating disorder, may in fact contribute to moderate the discrepancy and any misunderstandings with respect to different perceptions, in order to develop greater understanding of one's personal experience. This also opens up interesting research ideas in the context of how families negotiate conflicts in relation to emotive and behavioural problems connected to eating disorders.

Finally, our findings provide additional support to the general belief that is fundamental for clinicians to equally consider both parental points of view within the diagnostic and therapeutic process of patients with ED, As a matter of fact, our results show that choosing for the mother as the only informant on rating scales may lead to partial views of patients'

functioning (in this case, higher severity on externalizing behavioural problems, given the higher levels of perceived parental stress compared to fathers). Furthermore, given the possible unwillingness of ED patients to report emotional and behavioural problems, confirmed by the higher parent-reported scores revealed by our study, a multi-informant triadic approach is warranted in order to gather a valid picture of current and previous psychopathological symptoms of adolescents (Ekeroth et al., 2003).

3. Family alliances

The potential role of family factors has been increasingly recognized both in the complex pathogenic and maintenance mechanisms (Anastasiadou et al., 2014; Lock & La Via, 2015; Lyke & Matsen, 2013; Ravi et al., 2009; Rodríguez Martín et al., 2004).

In 1978 Minuchin theorized a family model in AN, called "psychosomatic", based on enmeshment, rigidity, hyperprotection and avoidance of conflict (Minuchin et al., 2014; Selvini Palazzoli, 1979);
others authors underlined that emotional difficulties (such as emotional avoidance and poor regulation) could be Implications at the social level of alexithymia traits (Gramaglia et al., 2020).
In line with this model, a review of 17 studies underlined that families of AN patients showed through self-report a significant worse functioning than controls (Holtom-Viesel & Allan, 2014).
Other evidence shows that, compared to families without any eating disorder, AN ones have more dysfunctional family relations (Gillett et al., 2009; McDermott et al., 2002; Sim et al., 2009).
Cerniglia and his group (2017) underlined difficulties in respecting interpersonal boundaries, poor tolerance of conflict and low satisfaction. It is still unclear if there are any differences based on the different eating disorders considered (Gillett et al., 2009; Holtom-Viesel & Allan, 2014; McDermott et al., 2002).

Other authors suggested that is anorexia nervosa that affects the adolescent and his/her family seriously triggering relational difficulties. In this line, Sim et al. underlined that parents of patients with eating disorders, especially of those with anorexia nervosa, not only have greater family conflict but also present more feelings of stress and depression (Sim et al., 2009). Other findings from recent studies (Balottin et al., 2014; Duclos et al., 2014) suggested in fact that not only the adolescent with anorexia nervosa but also her parents might present specific emotional difficulties within the familial relations.

Interestingly, Visani and colleagues (2014)pointed out that parents of AN daughters perceive their family as functional and positive when asked with a self-rated instrument. It is not well

known whether and how maternal perceptions differ from paternal ones (Holtom-Viesel & Allan, 2014).

Patients seem to have a different point of view, they perceive their family functioning more negatively than their parents (Dancyger et al., 2005). In particular, adolescent girls with AN perceive their family functioning as worse and are less satisfied with their families than a control group. AN girls see their family interactions as difficult and characterized by less emotional closeness to the experiences, activities and interests of other family members (Laghi et al., 2017).

Nevertheless the issue is still debated: literature data supporting the importance of the family dynamics are contradictory and limited by a wide variety of methodological approaches, mainly based on self-rated assessment (Holtom-Viesel & Allan, 2014), which implies significant limitations due to the patients' self-awareness (Mannarini, 2009), desire and capacity to report about their own experiences and perceptions.

Moreover, important authors, as Herpertz-Dahlmann et al. (2011), believe that anorexia nervosa is a predominantly neuropsychiatric disorder in its pathogenesis, which has little to do with the "model of psychosomatic family," firstly described by Minuchin et al. (1975). The Academy of Eating Disorders (Le Grange et al., 2010) has disclosed a clear and strong position about this debated issue, declaring to be "firmly against any aetiological model of eating disorders in which family influences are seen as the primary cause of anorexia nervosa or bulimia nervosa."

From a therapeutic and family-oriented point of view, it seems in fact sterile and even harmful to blame the parents, preventing them from taking the pivotal role of help and support to the adolescent care, a task for which they cannot be replaced (Apter & Palacio-Espasa, 2012; Novick & Novick, 2011).

The focus of the interest therefore seems to have moved from the causal and pathogenetic or maintaining role of family factors to their facilitating role for the treatment of the disorder (Holtom-Viesel & Allan, 2014). The problematic dynamics could then become the starting point for effective therapeutic strategies (Anastasiadou et al., 2014; Lock & La Via, 2015; Lyke & Matsen, 2013); nowadays, parents are considered as an important resource in the treatment of EDs (Le Grange et al., 2010). Indeed, according to longitudinal studies (Gowers & North, 1999; Woodside et al., 1996), the patient's more positive perception of family functioning seems to be linked to a better outcome (Holtom-Viesel & Allan, 2014).

Shedding light on dysfunctional characteristics of the family interactions might therefore be a preliminary helpful step for the promotion of the most adequate therapeutic choices for each single patient and family, at the same time directing therapeutic work on the most salient aspects that need to be modified at a family level, in order to improve the chances of the patient care. In line with these premises, in their systematic review Holtom-Viesel and Allan (2014) suggested the need to carry out further studies on family functioning in families of patients with REDs, using observer-rated clinical tools, since most research about triadic interactions in families of patients affected by AN use self-reported information and/or non-standardized clinical assessments.

3.1 The Lausanne Trilogue Play (LTP)

The LTP is a semi-standardized observational tool based on a videotaped, semi structured play session, aimed at studying the triad as a whole as well as the organization of its parts (Fivaz-Depeursinge & Corboz-Warnery, 1999). Parents are asked to interact (i.e., imagine organizing an activity together) with their daughters in four phases. The first two phases are indicated as two-plus-one phases. In the first phase, one parent is asked to interact with the daughter, while the other parent is simply present. In the second phase, the second parent is asked to interact with the daughter, while the parent who played first is no longer involved. In the third phase (three-together phase), the parents are asked to interact together with their daughter as a triad. In the fourth phase (again a two-plus-one phase), the parents are asked to continue to interact and converse with each other, without involving the daughter. The whole play section takes approximately 15 min.

The narrative of a situation based on separation and autonomy is the theme of the triadic play, tailored for adolescent patients. Parents and daughter are asked to organize a weekend, in which the daughter will remain at home without the parents. They have to build this narrative, following the four different phases. Nevertheless, in order to code the family relationships, the content of the narrative built is not very important, but it is essential to note how the family shares the construction of the narrative, based on the frequency of initiatives and proposals intended to enrich the history (that should be co-constructed with the contributions of each family member). The LTP paradigm (Fivaz-Depeursinge & Corboz-Warnery, 1999) was modified to be applied to adolescents up to 18 in a clinical version named LTPc (Lavadera et al., 2011; Malagoli Togliatti & Mazzoni, 2006). The coding scheme of the LTPc (Malagoli Togliatti & Mazzoni, 2006) used herein was adopted and explained in other international works (Lavadera et al., 2011; Silvia Mazzoni & Lavadera, 2013). Fivaz-Depeursinge supervised the modifications of the task and the coding system proposed and manualized by Malagoli Togliatti and Mazzoni (2006).

The coding scheme comprises four scales, each defining an observational variable measured for each individual and for each phase and graded on a 3point Likert scale (0 = dysfunctional, 1 = partially functional, 2 = functional). The two judges are required to define the presence–based on the frequency and duration –or the absence of some behavioral indicators (i.e., a given behavior during the activity) in order to assign a score to each functional level: participation, organization, shared attention, and emotional contact:

- **Participation** is the ability to get involved in the same interactive space (i.e., the disposition to take part in the interaction, expressed also in the body orientation), getting in touch with the other family members (McHale et al., 2001). It indicates the inclusion or the exclusion of a member of the triad and is assessed by observing how the participant places his body in the interactive field, in particular, if he/she sits correctly and if he/she orients his/her body to other family members and the task. Participation represents the simplest function to be achieved and the lowest step to establish collaboration, which have to remain stable throughout the interaction time, because without an adequate physical orientation and closeness it is not possible for the participant to interact and play with the other family members.
- **Organization** is the capacity of each participant to play a role coherent with the different parts of the play: the roles played by each parent and the daughter have to be different according to the different phases. When a parent is in the active position, he/she should help his/her daughter in the activity providing suggestions and supporting and encouraging the girl's proposals. When a participant is in the observer position, he/she should take up this role quickly, remain involved in the interaction, demonstrating his/her support for the partner without trying to replace him/her, and repairing any errors or deficiencies of the other parent. In the first two parts, the daughter should work together with the active parent, proposing initiatives but also being able to be guided to the target. In the third part, the three members should coordinate and alternate without competing with each other, proposing initiatives that facilitate the inclusion of all members in the current play. In the last phase, the parents must be able to leave a certain autonomy of action to their daughter and to interact with each other as a couple; the daughter must be able to accept this exclusion and continue the assigned task alone. This functional level (organization) also evaluates the participants' coherence to the subsystem to which they belong: since parents represent the structuring system and the daughter the evolutive subsystem, they are expected to play differently.
- **Shared attention** assesses the ability to reach and maintain a joint attentive focus, shared by the triad during the play, which allows to communicate meanings and affections and to co-construct a common narrative plot during the whole play. The shared attention is achieved when each of the participants (regardless of the role played in a specific phase) pays attention to the interactive elements, to the ongoing activities and to the actions of the other participants, sharing meanings with each other

by mean of looks, gestures, and words. A participant gets a functional score if he/she watches the game and the other participants, speaks about the game and its plot, follows the play goal agreeing with the other family members. The coherence among gazes, actions and verbalization is crucial in achieving a functional focalization.

- **Emotional contact** is the more complex functional level, which implies the emotional sharing, the reciprocity and communion of affections (McHale et al., 2001). It is evaluated observing the affective tone shown during the triadic play by means of ways of looking, physical contact, verbal communication of affections and reinforcements within the triad. It is expected that the individual smiles spontaneously, makes jokes and laughs at others' jokes, he/her should express approval and praise for the initiatives proposed, showing complicity with the partner. In short, if each participant is able to have fun in an authentic and shared way, a good affective contact is achieved. This coding system allows having a score for each family member and for each functional level in each part of the play, a combined family score for each functional level and for each part and finally a global score of family functioning. The global score of the family is the sum of the overall scores for each family member and represents a dimensional assessment of the triadic coordination that ranges from 0 (absent coordination) to 40 (maximum coordination).

The cut-off to distinguish the families into categories of different alliances are: 0 to 23 for low coordination families and 24 to 40 for those families with a high coordination. According to the Lausanne Group, the family alliance construct indicates the quality of the coordination expressed by the family while sharing the play experience and while trying to reach a common goal. In particular four types of family alliances were distinguished based on the global coordination exhibited:

- Disturbed (global score 0–16): the family cannot carry out the task of the play because the roles are not well defined and undergo continuous interference. The game pieces are confused and overlapping, generating a continuous tension and ambiguity or even the exclusion of a member of the triad. The emotional climate is negative, although it may present a "false-positivity" (positivity surface expressions which mask deep underlying negative emotions);
- Collusive (global score 17–23): there is a division of the parental subunit; these families fail to achieve the goal of the game and to share fun. The difficulty of the parental subsystem to provide help and guidance to the child or of the child to accept the

"guidance" of the parents is clear. Competition between parents is present and can become evident. The emotional climate is crossed by a constant tension repaired and often hidden by an apparent serenity;

- In tension (global score 24–32): the family plays together but encounters obstacles that create "tension" in the emotional climate, otherwise serene. The coparenting coordination in some moments of the game is lost, threatening the emotional sharing. Despite these ups and downs the parents try to repair the wrong co-ordinations, restoring a cooperative atmosphere;
- Collaborative (global score 33–40): it is observed in families that show a good level of cooperation and coordination. The family plays together as a team, reaching the established goal of affective sharing. Parents work together and coordinate to facilitate the child; in the case of "missteps," the parental subsystem manages to repair effectively.

Video feedback

The authors immediately postulated the need to give parents feedback on their performance, which would repay them for their contribution to research and hopefully be an experience of growth.

In this feedback session, the focus is primarily centered on the parents' experience as subjects, their questions and comments relating to the child's skills and intuitive parental behaviors. A key moment is the identification of the moment when "working together" is missing and mutual support is of great help, as it determines the starting point used by the consultant during the video review.

In summary, the purposes of video feedback would be:

• promote positive parenting

• promote observational skills, especially those necessary to grasp the interpersonal relationship

• promote empathy towards children

• carry out psychoeducational interventions based on collaboration with the expert, defining a working alliance

3.2 New perspectives using the Lausanne Trilogue Play

Several studies confirmed that an early evaluation of the triangular interactions can be useful to predict some core aspects of the child psychological development: children in fact learn to regulate their inner states and emotions in the context of the family relationships. Studying in a community sample the longitudinal development of the family interactions since pregnancy, Favez et al. (2012) demonstrated a relationship between the familial alliance (i.e., the quality of the triadic coordination exhibited during the video-recorded play) and the cognitive-emotional development of the child at the age of 5. Along with the child temperament, a high stable family alliance appeared to predict better outcomes in children, in particular for the development of the Theory of Mind (Baron-Cohen, 1991). Moreover, a Swedish research Hedenbro and Rydelius (2014) showed that children who exhibit better triangulation capabilities within the family at 9 months have better peer and social competences at the age of 4. In turn, the early triangulation capabilities and specifically the turn-taking competence correlate with the quality of the parents' responsiveness.

The direct observational method, based on a recorded play session, named Lausanne Trilogue Play (LTP) (Fivaz-Depeursinge & Corboz-Warnery, 1999), may therefore be a valuable tool in identifying children and families with communication deficits and dysfunctional relational patterns at an early stage.

For example, prenatal LTP may open a window into the development of the coparental behaviors and representations before the baby's birth (Altenburger et al., 2014). A significant continuity was in fact observed between the prenatal coparental behaviors and the observed coparenting behaviors 1 year later; moreover, fathers who engaged in higher quality prenatal intuitive parental behaviors were discovered to exhibit more supportive parental behavior during the postpartum, when pregnant mothers presented lower parenting behaviors (Schoppe-Sullivan et al., 2014). The high potential for clinical intervention in relationally frail family systems was also demonstrated in a study (Mchale & Coates, 2014) concerning African-American unmarried couples, which found that the majority of families showed high degrees of disengagement and tension-competitiveness, signaled by disputes and interferences.

A recent study (Gatta et al., 2016), aiming to examine the usefulness of the LTP as an outcome measure, found that the LTP assessment of the family interactions might help

clinicians to focus on the dysfunctional familial dynamics, thus improving the effectiveness of a video-feedback intervention with the families of children and adolescents with psychiatric disorders (i.e., significantly reducing internalizing symptoms).

Despite the increasing number of studies using this innovative observational tool in different family contexts (Frascarolo et al., 2005; Lavadera et al., 2011; S. Mazzoni et al., 2015; Simonelli et al., 2012), data regarding families with adolescent offspring are still extremely limited.

These considerations pave the way to an in-depth exploration of this procedure in the context of the adolescent psychopathology, aiming to investigate if the LTP might help to discriminate core aspects of family functioning in different disorders.

In restrictive eating disorders LTPc has already shown **strong ability to detect the specific characteristics of the family triadic interactions** in the context of therapeutic orientation, preventive, and social interventions in restrictive eating disorders.

In 2017, our research group in collaboration with the University of Padua conducted a first case-control study comparing family functioning of 20 families of patients with anorexia nervosa and 20 families of girls with internalizing disorders (Balottin et al., 2017).

The overall triadic coordination exhibited by the families of adolescents with anorexia nervosa was significantly lower than that of the families from the clinical comparison group.

The low coordination alliances, in particular the collusive ones, were characteristic of the families of patients with anorexia nervosa, that were mostly judged to have dysfunctional family alliances.

Regarding the functional level:

- **Organization**: significant results were found as regard Phases 3 and 4. In Phase 3 families of adolescents with anorexia nervosa were evaluated more often in the dysfunctional category, evidencing the problematic interaction within the triad; conversely the clinical control families were associated more often with the functional category, showing that in these families the organization of the roles within the triad is more coherent. In Phase 4, the triads from the families of girls with anorexia nervosa therefore did not comply with their role in the third and in the fourth phase. All members of the family had difficulties in establishing triangular interaction, failing to coordinate with each other during the third phase. Moreover, the daughters affected

by anorexia nervosa as well as their mothers and fathers scored lower in the organization of the roles, not only in the third but also in the fourth phase.

- **Shared attention**: significant results are observed in Phases 3: appropriate joint attention is achieved more often by the clinical control families. This could be because of the specific difficulty in maintaining a triangulation and in including a third individual in it.
- **Emotional contact**: significant results were found regarding Phases 3 and 4. As far as emotional contact is concerned for both phases, families of adolescents with anorexia nervosa seem to be more dysfunctional; in particular in phase 3, emotional sharing and affective reciprocity seemed to be more appropriate for the clinical control fathers and daughters; in phase 4, the affective contact of fathers and mothers belonging to the research group is significantly more dysfunctional.

Potential clinical implications can be drawn from the picture of the triadic relations interactions, with respect to the key role played by parents, and in particular by fathers, in the families of adolescents with restricting type anorexia. The findings of the present study suggest in fact that the collusive families of patients with anorexia nervosa often exhibit a division within the parental subunit, along with a competitive climate between parents, which can be either manifested or hidden by an apparent serenity (Malagoli Togliatti & Mazzoni, 2006). In particular within the triads of the research group, the quality of interaction showed a deterioration in the third (three-together) phase where families were required to display a greater triangular coordination. The parental subsystem experienced difficulties in maintaining a structuring role in relation to the daughter's initiatives, providing her help, support, and guidance; adolescents with anorexia nervosa in turn struggled in showing independent proposals and in developing personal projects and ideas. Moreover, the fourth phase of the LTP showed major difficulties on the parents' part to carve out a couple-specific relational space.

Since recent literature emphasizes that the involvement of the parental couple and of the whole family cannot be disregarded in treating adolescents with eating disorders (American Psychiatric Association, 2006; Espie & Eisler, 2015; Hay et al., 2017; Herpertz-Dahlmann, 2015; Lock & La Via, 2015; National Collaborating Centre for Mental Health (UK), 2004), the potentially dysfunctional interactive dynamics within the parental couple and within the triad emerged from the study may represent an obstacle for an effective treatment. In line with the current literature (Duclos et al., 2014; Godart et al., 2012), the results of our study

might therefore support the clinical indication to tackle the emotional contact and to improve the father's participation in the mother–daughter relationship. Paternal involvement and warmth prove in fact to be fundamental for the outcome and those fathers who tend to slip away and remain excluded emotionally and concretely need to be encouraged and supported (Couturier et al., 2013; Godart et al., 2012; Hay et al., 2014; Horesh et al., 2015).

The present study

(Mensi M.M. et al., Focus on family functioning in anorexia nervosa: new perspectives using the Lausanne Trilogue Play. Psychiatry Research; 2020)

Comparing adolescent patients with AN with patients suffering from other psychiatric disorders, the present study aimed to:

1. explore the presence of dysfunctional dynamics in AN families compared with families with daughters affected by different disorders, in order to confirm or not previous findings obtained using the Lausanne Trilogue Play (LTP);
2. investigate whether the overall functionality or dysfunctionality of the families depends more on participation, organization, focal attention or affective contact, i.e., whether one of the total functional levels exhibit a greater influence on the type of alliance (global score);
3. applying the same approach regarding the four phases (mother-daughter dyad, father-daughter dyad, triad, and parental couple), questioning if one or more phases mainly influence the general LTP family scores.

Materials and Methods

We recruited 31 families of patients affected by AN and 20 families of patients with emotional and behavioral disorders of childhood and adolescence, according to ICD-10 criteria (World Health Organization (WHO), 1992), referred to Child Neuropsychiatry Unit.

We included only female patients diagnosed with anorexia nervosa (ICD-10), aged between 13 and 18 years and with a current BMI below the tenth

percentile per age and sex. All families participated in a videotaped play session by means of a video camera put on a movable tripod according to the clinical version of the LTPc procedure. Two specifically trained judges, blind to the results of the other evaluations, scored it. In rare cases of disagreement in attributing the score, they reached an agreement through discussion.

Results and Discussion

None of the families of adolescents affected by AN exhibited collaborative alliances and only 32% of them presented in tension alliances. They mostly showed **collusive (50%) and disturbed (18%) alliances**, while families of patients with emotional and behavioral disorders bared only collaborative (35%) and in tension (65%) ones.

Comparing LTPc scores between AN families and comparison ones, we found that these last would globally have a better functioning in all the investigated indicators.

Table 1
Differences between AN families and emotional and behavioral disorders of adolescence ones relatively to family LTPc total parameters.

LTPc parameter	Group	*Mean*	*SD*	*p-value*
Total general LTPc				
Participation	AN	6.355	1.427	$3.869*10^{-5}$
	Comparison	7.850	0.366	
Organization	AN	3.516	1.207	$7.733*10^{-6}$
	Comparison	5.400	1.535	
Focal attention	AN	3.741	1.413	0.0001
	Comparison	5.400	1.465	
Affective contact	AN	3.355	1.199	0.0003
	Comparison	4.400	0.883	
Family total score	AN	21.613	4.709	$6.877*10^{-6}$
	Comparison	29.050	4.684	

Statistical significance was attributed in case of $p < 0.05$

We confirmed that AN families exhibit worse scores in all parameters than the comparison group, but we carried out more accurate statistical analysis to find out which of the four functional levels mainly influenced the general LTPc total

score in both groups, considering the ratio between each specific score and the total one.

Table 2
Influence of the four components on the total score in each group.

AN families	Participation	Organization	Focal attention
Organization	$4.7*10^{-9}$		
Focal attention	$7.5*10^{-9}$	0.47	
Affective contact	$4.7*10^{-9}$	0.84	0.47
Emotional and behavioral disorders of adolescence			
	Participation	Organization	Focal attention
Organization	$6.6*10^{-7}$		
Focal attention	$6.6*10^{-7}$	0.93506	
Affective contact	$63.9*10^{-7}$	0.00074	0.00074

Statistical significance was attributed in case of $p < 0.05$

The greater influence of participation and organization, which represent the basic functional levels, on the total scores in AN families could be due to the members' difficulty to coordinate and alternate, coherent with transitions from one phase to

another appearing rigid and forced, with different game plots for every phase. At the same time, the duration of the procedure was often not appropriate (too short or too long). Considering the organization, in our clinical sample, some mothers did not capture the requests of their daughter and so they determined according to their own view the content and the style of the activity. When assuming the role of observer, these mothers showed the tendency to substitute the other parent, somehow expressing disagreement and opposition. Daughters tended to ask for mother's help in order to continue the game, while fathers usually released themselves. This paternal weakness may stand for a defensive reaction in front of the daughter's illness, but at the same time it may entail a less affective connection and it can influence the quality of family interactions and the AN outcome (Balottin et al., 2014).

Adolescents affected by emotional and behavioral disorders and their families showed a more disharmonious profile, characterized by lower values in the affective contact, the superordinate and more complex functional level,

compared to better performances in the other functional levels. On the other hand, AN families exhibited a much more harmonic profile, characterized by globally low scores in all levels. In fact, if they failed in the first functional levels (participation and organization) they could not later be in emotional contact. Vice versa, the other group's performances were lacking only in the affective contact because their psychopathology influenced the emotional expressivity.

Then, we searched for differences of the groups between the phases. Statistically significant differences between the two groups emerged in various phases, showing that AN families exhibit more dysfunctional performances than comparison group.

Table 3
Differences between the two groups referring to LTPc parameters in each phase.

LTP phases and levels		*Mean*	*SD*	*p-value*
LTPc phase 1: Mother + Daughter – Father				
Participation	AN	1.677	0.475	0.070
	Comparison	1.900	0.308	
Organization	AN	1.065	0.442	0.080
	Comparison	1.300	0.470	
Focal attention	AN	1.129	0.428	0.009**
	Comparison	1.500	0.513	
Affective contact	AN	0.839	0.374	0.030**
	Comparison	1.050	0.224	
LTPc phase 2: Father + Daughter – Mother				
Participation	AN	1.774	0.425	0.095
	Comparison	1.950	0.224	
Organization	AN	1.097	0.396	0.105
	Comparison	1.300	0.470	
Focal attention	AN	1.032	0.442	0.216
	Comparison	1.200	0.410	
Affective contact	AN	0.936	0.359	0.098
	Comparison	1.100	0.308	
LTPc phase 3: Father + Daughter + Mother				
Participation	AN	1.516	0.769	0.005**
	Comparison	2.000	0.000	
Organization	AN	0.807	0.601	0.000**
	Comparison	1.450	0.510	
Focal attention	AN	1.0	0.683	0.036**
	Comparison	1.4	0.503	
Affective contact	AN	0.871	0.5	0.037**
	Comparison	1.150	0.366	
LTPc phase 4: Father + Mother – Daughter				
Participation	AN	1.387	0.803	0.001**
	Comparison	2.000	0.000	
Organization	AN	0.581	0.72	0.000**
	Comparison	1.350	0.587	
Focal attention	AN	0.581	0.564	$7.172*10^{-5}$**
	Comparison	1.300	0.470	
Affective contact	AN	0.71	0.529	0.004**
	Comparison	1.100	0.308	

Statistical significance was attributed in case of $p < 0.05$

Considering the influence of each phase on the general LTPc score, we conducted the analyses for each of the two groups individually to understand which phase has the greatest impact on the functional profile of the two types of family and, specifically, which affects the worst performance of AN families.

Table 4
Influence of phases overall the total score in both groups considered individually

LTPc phases		*Mean*	*SD*	*p-value*
LTPc 1	AN	6.194	1.302	0.006**
	Comparison	7.200	1.105	
LTPc 2	AN	6.097	1.248	0.037**
	Comparison	7.050	1.276	
LTPc 3	AN	5.097	2.612	6.429^{e-05}**
	Comparison	7.650	1.268	
LTPc 4	AN	5.097	2.612	3.623^{e-05}**
	Comparison	7.650	1.268	

Statistical significance was attributed in case of $p < 0.05$

In particular, in phase 1 (mother-daughter dyad) AN families frequently excluded the father when he was the observer, or the father himself did not pay any attention to what is happening around him, undertaking different lonely activities (i.e. answering the phone).

Considering the dyadic phase 2 (father-daughter dyad), we noticed that family functioning was quite like comparison's one. This may imply that when fathers took on an active role, they managed to improve the whole family functioning.

The most significant differences appeared in the third and fourth phases. Families had troubles in functioning as “three together” with a strong tendency of dyadic functioning supplied with the exclusion of one participant. Parents were not able to interchange themselves, as well as to coordinate and support each other. In addition, some daughters contributed to create a separation between their parents. Nevertheless, we also recorded a few patients’ attempts to include both parents in the game and to establish a real alternation; in these cases, however, the conflict between the parents often prevented parents and daughter from respecting the reciprocal ventures and from reaching an adequate coordination. Moreover, considering the fourth phase, the daughter was frequently included, even if parents were supposed to interact only as a couple.

Finally, the possibility of identifying, through LTPc, a distinctive profile of the AN families is of considerable importance. Coring in participation and affective contact may help discriminating AN families from families with daughter with different emotional and behavioral problems: the participation level is in fact

specifically compromised only in AN families. It is therefore worth noting that LTPc profiles and multivariate analysis might help clinicians discriminate different family patterns which specifically pertain to families with daughter diagnosed with AN.

Conclusions

The comparison between families of patients suffering from AN and families of adolescents affected by emotional and behavioral disorders of adolescence led us to confirm, also based on a semi-standardized observational method, the greater presence in AN, of family dysfunctional interactive models (Gillett et al., 2009; Holtom-Viesel & Allan, 2014; McDermott et al., 2002; Sim et al., 2009). In line with previous data (Balottin et al., 2017), families of patients with AN failed in enjoying the LTP game as a triad.

Regarding functional levels, it was found that in families of patients with AN, the most primary levels with respect to interaction, i.e., participation and organization, are affected. This fact implies that AN families exhibited an harmonic profile, characterized by globally low scores in all levels.

Considering the 4 phases, AN families had troubles in functioning as “three together” (with a strong tendency of dyadic functioning supplied with the exclusion of one participant); In addition, the functioning of the adults as a couple is compromised.

As a clinical implication, we would also stress the innovativeness of LTPc as preventive tool. Thanks to the predictive model, specific types of alliance and functioning during the four phases could foresee the risk of developing AN rather than other diseases, intervening as early as possible. Finally, by means of the LTPc procedure, clinicians could shed a light not only on family difficulties, but also on their strengths in order to decide which type of intervention is the most suitable, with the aim of improving the prognosis of a disorder that frequently tends to persist and to be really invalidating.

3.3 Perceived and observed family functioning

As seen before, literature data supporting the importance of the family dynamics are contradictory and limited by a wide variety of methodological approaches, mainly based on self-rated assessment (Holtom-Viesel & Allan, 2014), which implies significant limitations due to the patients' self-awareness (Mannarini, 2009), desire and capacity to report about their own experiences and perceptions. Moreover, we do not have clear data about the present of any difference between parents' perceptions. Some studies highlighted different parents' perception on family functioning, while others pointed out no differences between parents (Ciao et al., 2015; Criscuolo et al., 2020; Laghi et al., 2017; Ma, 2011; Wallis et al., 2018).

We have also demonstrated that LTPc could be extremely useful to collect the opinion of an experienced clinician about family functioning in a standardized way.

The present study

(*Mensi M.M. et al., Perceived and observed family functioning in adolescents affected by restrictive eating disorders; Family relations; submitted 2020*)

Considering that FACES-IV (Olson & Gorall, 2006; Visani, 2014) is a self-administered instrument largely used in clinical assessment to obtain information about family functioning and Lausanne Trilogue Play is a standardized direct observation made by clinicians, the present study aimed to:

1. highlight, through self-administered instruments such as FACES-IV, the presence of a typical pattern of family functioning in AN
2. compare parents' perception in FACES-IV subscales, in order to point out potential differences between mothers and fathers
3. compare FACES-IV with, the clinical Lausanne Trilogue Play in order to compare internal evaluation of family functioning made by parents with an external one.

Materials and Methods

We recruited 40 families of female patients with diagnosis of restrictive eating disorder according to DSM-5 and age between 12 and 18 years old.

Each parent received the FACES-IV (Olson & Gorall, 2006; Visani, 2014) questionnaire and the whole family was observed through the procedure of LTPc (Malagoli Togliatti & Mazzoni, 2006).

Results and Discussion

Our study showed that in parents' opinion, among families of girls with AN, there is a generally good communication, low levels of enmeshment, intermediate levels of cohesion, flexibility, and disorganization and intermediate or low levels of disengagement. This is in line with previous literature that suggests a positive parents' perception of family functioning (M. Fisher & Bushlow, 2015; Laghi et al., 2017; Visani, 2014).

Regarding agreement between parents, our study shows that there is a positive correlation between parents in FACES-IV subscales between all the subscales of FACES-IV except for the rigidity.

Table 1. Parents' significant means and standard deviations in FACES-IV subscales.

FACES-IV Subscale	**Mother** ***N* = 20**		**Father** ***N* = 20**	
	M	***SD***	***M***	***SD***
Balanced Flexibility	53.83	19.72	54.95	18.67
Balanced Cohesion	57.8	22.37	61.55	22.51
Enmeshment	31.45	23.53	35.15	22.66
Disorganization	39.42	24.99	43.2	26.27
Disengagement	38.2	22.31	33.52	24.45
Communication	34.75	7.23	35.47	6.75
Flexibility Ratio	1.65	1.24	1.63	1.92

Furthermore, as shown in table 1, we found that both perceived low levels of enmeshment and intermediate or low levels of disengagement. This is consistent with previous studies (Ciao et al., 2015; Criscuolo et al., 2020; M. Fisher & Bushlow, 2015; Laghi et al., 2017; Ma, 2011; Wallis et al., 2018), which showed a general agreement between family members.

We also found that there is a general parental agreement in disorganization, in which the mean scores of both parents are indicative of intermediate levels, and in communication, according to previous studies (Laghi et al., 2017; Visani, 2014). Nevertheless, these results derive from a self-administered evaluation and it could be little objective because it evaluates parents' judgments, sometimes influenced by the refusal and avoidance of the conflict, as well as by the idealization of family relationships (Casper & Troiani, 2001; Vidović et al., 2005).

We related the scores of LTPc with the scores of both parents in the different scales of FACES-IV and we found significant correlations between LTPc and parents' perception.

We investigated the potential correlation between the ratio at FACES-IV and the scores at LTPc; however, our analysis underlines that only father's cohesion ratio is positive related to total family LTPc score. This is in line with the construct of the ratio, that is used to evaluate if the family is oriented more to balanced or to unbalanced aspects: the higher the ratio is, the more functional the family is (Visani, 2014). This result shows that family is more functional when fathers perceive high levels of balanced cohesion, associated with low levels of enmeshment, and disengaged. In this regard, fathers demonstrate more objective perceptions than mothers: this is in line with other studies, revealing that, in families of anorexic patients, fathers tend to be more critical than mothers, who are instead overinvolved in their children suffering (Anastasiadou et al., 2014; Kyriacou et al., 2008; Whitney et al., 2012).

The fact that there are no other significant correlations between ratio at FACES-IV and levels of LTPc shows that parents' perception should be considered different from the clinician's point of view. This emphasizes that entrusting the evaluation only to a self-administered instrument is less reliable than a clinical assessment made by a professional through a standard tool. So, the LTPc becomes an essential instrument of the assessment of family dynamics in anorexic patients.

These results are confirmed also by the comparison between the total score at LTPc and the global ratio at FACES-IV.

In fact, most of our families showed a total LTPc score which corresponds to collusive alliance, which is indicative of a dysfunctional family functioning. In this type of alliance there is a not negotiated conflict between parents, who shift it on their daughters, using them as a mediator or a scapegoat (Fivaz-Depeursinge & Corboz-Warnery, 1999). This

result is corroborated also by the mean of total LTPc score, which is 19.68, confirming the collusive alliance.

However, the mean of mother' and father's global ratio is higher than 1 (mother's global ratio: 2.15; father's global ratio: 1.69) showing that parents perceive their family as oriented toward positive and functional aspects. This result is confirmed also by mothers' and fathers' score in communication, in which they refer good levels. The fact that parents perceive their family as functional was described also by Visani et al. (2014), who stated that, when considering every member's point of view, there is a prevalence of positive ratio.

Nevertheless, in our opinion, parents' point of view could be an important starting point during the therapy, precisely because it corresponds little to clinical evaluation.

Furthermore, we found other important correlations. Our analysis underlined that rigidity perceived by mothers (assessed through FACES-IV) is negatively related to total organization at LTPc. Since rigidity in FACES-IV is referred to a system characterized by high discipline, defined roles and a familiar style with poor possibility of negotiation (Olson, 2000), high levels of rigidity are hypothesized to be related to difficulties in coping with life circumstances in family life and in outside environment (Laghi et al., 2017).

Furthermore, transitions between the four phases of LTPc are a model of ability to adapt to new circumstances; in fact, they involve the need to redraw the organization and the role of each participant (Castellina et al., 2006). This is in line also with a recent study, which shows that, in anorexic families, high rigidity is predictive for more serious psychopathology (Cerniglia et al., 2017).

As such, since participants of LTPc are asked to adapt continuously at new roles, we suppose that high levels of rigidity are related to low levels of organization and vice-versa.

Our findings are consistent also with the positive correlation found between fathers' balanced flexibility and LTPc total organization: in fact, this dimension is meant as the ability to adapt to different phases of life, to socio-cultural contexts and to both internal and external events of family life. It establishes the balance between organization and disorganization (Visani, 2014). In the light of the above, it is particularly noticeable that high levels of flexibility are related to a better organization at LTPc.

Moreover, recent studies underlined that families of anorexic patients are characterized by a poor organization at LTPc, due to the difficulty both of parental couple and of daughter in maintaining their own role during all the phases: in particular patients would try to be included in the dyadic part between parents, in order to reduce the conflict between

parental couple (Balottin et al., 2017). Our analysis is consistent with this observation: in fact, we found that mothers' enmeshment is negative related with both mothers' and daughter's organization at phase 4. This means that if mothers are enmeshed, they do not let daughters play alone or, at opposite site, they are not able to correct their daughters when they try to be included in the marital couple. This data was shown also by Balottin et al. (2018), who underlined that anorexic adolescents are not able to let the parents interact in the fourth phase, becoming involved in their relationship; in particular, they act as they should control the relationship between their parents.

Our analysis also shows a positive correlation between the parents' mean of percentile score in cohesion and total affective contact at LTPc: as the definition of cohesion points out, it shows the balance between sense of belonging and separation. This dimension embraces the way in which every member interacts with others in family's relationships (Visani, 2014). So, higher levels of cohesion relate to better balance in emotionality. This shows that if family members are cohesive each other, they can express better positive emotions. This is also confirmed by a recent study (Balottin et al., 2017) which underlines that the parental conflict often negatively impacts both on the parental and on the familiar affective warmth.

Conclusions

Our study has the important strength to first evaluate the comparison between self-administered measures of family functioning and a standardized direct observation instrument, such as the LTPc, cause, there are no other studies in literature that use and compare these two measures.

We found a general agreement between parents at FACES-IV subscales and we also recognized as typical pattern of family functioning, that parents describe as generally functional.

Nevertheless, using the LTPc we found that most of the families have "collusive alliance".

Comparing this data with results at FACES-IV we underlined that parents' perception should be considered less objective than the clinician's point of view. In this line, the LTPc becomes an essential instrument of the assessment of family dynamics in anorexic patients.

However, our analysis showed that father's perception is more objective than mother's one and more like to the clinician's point of view. This is consistent with other studies, which

show that fathers are more critical and less involved in their daughters' illness (Anastasiadou et al., 2014; Kyriacou et al., 2008; Whitney et al., 2012).

Our study firstly suggests that FACES-IV cannot be considered as the only family assessment measure for this type of patient. Self-report tools introduce clinicians to the represented family level, that is the frequently idealized perceptions of functioning, while direct observational instruments reveal the level of the practicing family, that is, the interactions in the here and now of the evaluation (Reiss, 1989). These two levels can show a discrepancy between the image that family wants to propose and the level of the interactions it expresses and may represent a relevant clinical issue for the patient.

So, our results suggest to using both self-report and observational instruments in family functioning assessment of AN patients. Self-report questionnaire should be considered as an important starting point during the treatment, to discuss with family member the possible discrepancy with observational instruments and to facilitate the understanding of the real difficulties which affect their family, in order to modify and improve their family functioning.

4. Are family relations connected to the quality of the outcome?

In a meta-analysis also including cases of adolescents, Vall and Wade (2015) identified the intensity of symptoms' change during the early phases of treatment as the best outcome predictor, both at the end of therapy and at follow-up.

On the one hand, previous studies have revealed that some parents are likely to show unhelpful behaviours for the patients' outcome, such as accommodating behaviours and dysfunctional interpersonal interactions (Franta et al., 2018). When both parents are highly accommodating, these accommodating behaviours may maintain the illness and negatively influence the outcome of adolescents (Salerno et al., 2016).

Treasure and Schmidt (2006) exemplify how interpersonal relationships between caregivers and patients play an important role in the recovery of patients with AN. They illustrate how unhelpful parental reactions, overflowing parental emotions of any kind and dysfunctional parental communication styles may maintain AN symptoms and therefore lead to a vicious circle of dispute, avoidance and misunderstanding, which might worsen the parents' and patients' outcome as a result: It may not only hinder the recovery of the patients but might also lead to clinically relevant anxiety and depression in caregivers themselves (Anastasiadou et al., 2014; Kyriacou et al., 2008).
Moreover, a poorer perception of family functioning on the patient's part seems to worsen the outcome of treatments offered, as confirmed by two studies (Ciao et al., 2015; Wallis, Miskovic-Wheatley, et al., 2017) published after the systematic review conducted by Holtom-Viesel & Allan (2014).

The present study

(Balottin et al.; *Are family relations connected to the quality of the outcome in adolescent anorexia nervosa? An observational study with the Lausanne Trilogue Play*; Clinical Psychology and Psychotherapy; 2018)

Starting from the specificities found in the families of adolescents with restrictive eating disorders with LTPc procedure, this study aims to:

establish a potential correlation between the specific relational patterns of the patients' families, measured by the LTP, and the clinical outcome of the adolescent's disorder, following a 6-month therapy period.

Materials and Methods

We recruited 24 families of female patients with anorexia nervosa restrictive subtype, according to the DSM-5 (American Psychiatric Association, 2013) and age between 13 and 18 years old.

The families participated in a videotaped play session according to the LTP procedure (Fivaz-Depeursinge & Corboz-Warnery, 1999) in its clinical version (Malagoli Togliatti & Mazzoni, 2006), before the treatment; the MROAS (Morgan & Hayward, 1988), adapted to the adolescent age by Jeammet et al. (1991) was used at baseline and at 6 months follow up in order to evaluate the change (outcome) of the patient.

The treatment applied consisted of the following elements: neuropsychiatric monitoring, nutritional counseling, individual psychodynamic psychotherapy once a week-based on the adolescent-focused therapy (Fitzpatrick et al., 2010) and parental counselling and support (fortnightly) based on the model by Godart et al. (2012).

A Many Facet Rasch Model (MFRM) analysis (Linacre, 2005) was applied.

Results and Discussion

The results of our family interactions assessment (LTPc) prior to therapy strongly related to the outcome of the patients, evaluated with the MROAS after a 6-month treatment period, showing primarily that:

1. The severity of clinical presentation at first observation was associated with a significant and prevalent disorder on the girl's part in establishing positive interactions with her mother and her father, in particular, in triadic interactions.

   Data concerning the relation between the severity of the disorder and the family relationships suggest that the overall severity of the adolescent disorder can be associated with an elective difficulty in triadic interpersonal interactions, which means a specific difficulty in overcoming the most infantile developmental phases (dyadic vs. triadic relationship) and achieving a rich and flexible ability to interact with others.
2. As to the outcome, the adolescent's improvement was significantly associated with her better functioning in family relationships, evaluated at first assessment, both in terms of dyadic and triadic interactions.

The patients' and parents' ability to positively interact within a triadic relationship seems to correlate with a positive prognosis and a better sensitivity to treatment.

3. Concerning the quality of the whole family relationships, clinical improvement seemed associated with previous difficulties in dyadic relations with the adolescent girl on the mother's and the father's part, which indeed contrast with a good triadic interaction.

It is likely that these patients could more deeply benefit from a family therapeutic approach, such as the French FT (Godart et al., 2012); in these cases, in fact, the adolescent's conflict with the mother and the father appeared since the first assessment to be overt and therefore could benefit from the clinicians' help to the parents in facing and managing it.

We can also suppose that these adolescents suffer from a less serious psychopathological condition, because from the beginning of the treatment, they showed better triadic interactive and relational abilities, which may be linked to a more positive perception of autonomy and separation, although sometimes conflictual, from the parents (Brusset, 2004; Jeammet, 2010; Russell et al., 1992). According to recent studies on family functioning and adolescent anorexia (Balottin et al., 2017; Wallis, Miskovic-Wheatley, et al., 2017), a decline in the mother-daughter and father-daughter relationship quality may just reflect a physiological adolescent autonomy process. Accordingly, the main guidelines for the management of eating disorders (American Psychiatric Association, 2006; Espie & Eisler, 2015; Hay et al., 2014; Herpertz-Dahlmann, 2015; Lock & La Via, 2015; National Institute for Clinical Excellence (NICE), 2017), support family therapy as the first line treatment, especially in the case of less sever and younger patients with a recent onset of anorexia.

On the contrary, we can suppose that patients with a more sever psychopathological condition would benefit from a supplementary individual treatment (such as adolescent-focused therapy in addition to the family therapy), addressing directly and precociously adolescent autonomy issues, which seemed in these cases more problematic.

These latter patients in fact showed less conflictual dyadic interactions with parents, although triadic interactions were the most deficient and problematic. Reinstate a physiological adolescent development trajectory would be in these cases more difficult but it can be considered a pivotal aim to be targeted in the recovery process, because severe anorexia and more marked psychiatric problems appeared to be intricately

linked (Ciao et al., 2015; Wallis, Miskovic-Wheatley, et al., 2017). We believe that such a goal can be more easily achieved using both an individual approach to support the adolescent and a family or parental one, in order to help parents in accepting and enhancing the adolescent's changes as well as in tackling the eventual premorbid family and parental issues, which may have prevented those changes (Godart et al., 2012; Wallis, Miskovic-Wheatley, et al., 2017). A growing body of literature indeed indicates that therapeutic approaches to severe adolescent anorexia nervosa should include the paternal participation (Couturier et al., 2013; Horesh et al., 2015; Jones et al., 2006), as well as the maternal one, in the treatment of the adolescent, thus favoring the parental alliance and the triadic interactions.

Conclusions

This study overall shows how triadic relational abilities exhibited by the adolescent girl within the family associate with a positive prognosis and a greater sensitivity to therapy.

In particular, we can hypothesize that, among family relational factors, the very issue of the triadic relational ability of the adolescent may present the highest value in characterizing the patients' profile and prognosis.

This feedback leads us to underline the importance of taking care of the whole family during the treatment of restrictive eating disorder.

We think that considering the different developmental trajectories of patients with this disorder, for some of them it is essential to work on the triad while for others it is essential an individual psychotherapy space and a separate space for parents to work on the separation-individuation process. LTPc could help to better address the therapeutic proposal because of the different familiar configurations.

However, a therapeutic proposal that guarantees 3 settings: individual therapy, support for the parental role and triadic intervention could therefore respond to the needs of all patients.

5. The Family Role in the Treatment of Anorexia Nervosa

The focus of the study of the family functioning seems to have moved from its potential etiologic role in maintaining the disorder to its facilitating role for the treatment of anorexia nervosa (Holtom-Viesel & Allan, 2014). As REDs tend to develop during adolescence, parents usually function as main caregivers.

The parental couple's participation and the involvement of the whole family in the adolescent's treatment process is recognized as a key prognostic factor by all the main guidelines for the treatment of anorexia nervosa (American Psychiatric Association, 2006; Espie & Eisler, 2015; Hay et al., 2014; Herpertz-Dahlmann, 2015; Lock & La Via, 2015; National Collaborating Centre for Mental Health (UK), 2004).

There are families who themselves seek help with their caregiving role (Haigh & Treasure, 2003), as parents feel the need for support and they have some insight into their own frailties. However, the importance of supportive interventions for the caregivers (help seeking or not) of someone with a RED has been demonstrated in various studies (Magill et al., 2016; Schwarte et al., 2017).

In these families, members tend to show accommodating attitudes and reorganise their behaviours around the REDs' symptoms (for example, they accept meal rituals and low-calorie foods and turn a blind eye to unwanted behaviours) (Sepulveda et al., 2009).

Strategies to meet the needs of parents of patients with REDs aim to equip parents with knowledge and behaviour change skills. Therefore, it is essential to support parents in specific skills and communication styles to help them handle difficult situations, in order to break the vicious circle (Truttmann et al., 2020). As confirmed by a meta-analysis of interventions for caregivers of patients suffering from AN, a parental care can reduce a carer's burden and improve caregiver skills (Hibbs et al., 2015).

It is mostly the mothers of adolescent patients who spend more time involved in care compared with fathers, mainly providing food and emotional support; and they usually report higher levels of distress and accommodating behaviour (Rhind et al., 2016), so many interventions were focused on them. However, **some pioneering studies have also shown that** encouraging paternal involvement could improve treatment outcomes (Couturier et al., 2013; Horesh et al., 2015). Yet the role of the fathers is still poorly studied and often misunderstood in favor of an exclusive and undue focus on the mother-daughter relationship.

The **family therapy**, which include the fathers as well as the mothers, has achieved the most relevant evidence of effectiveness (evidence type I) in the care of patients with restrictive eating disorders, especially on AN (Couturier et al., 2013; C. A. Fisher et al., 2019) and it is considered the first-line treatment for teens under the age of 19, especially in those with recent weight loss and illness duration below 3 years (Hay et al., 2014; Le Grange et al., 2010; Lock, 2011).

Several familial approaches have been developed and implemented over the last decades.

Family therapies, such as **systemic single-family therapy (SFT)** (Minuchin et al., 1975; Selvini Palazzoli, 1979) is one of the most famous ones.

The **family-based therapy** (FBT) or the **Maudsley family therapy** (Le Grange & Eisler, 2009; Murray & Le Grange, 2014), have their roots in the systemic approach along with the behavioural one; they have shown high levels of efficacy in the treatment of anorexia nervosa and in particular of adolescents (Couturier et al., 2013; C. A. Fisher et al., 2019). Early studies (Wallis, Rhodes, et al., 2017) investigating the therapeutic process and the changing mechanisms in family-based therapy showed that relational containment and parental confidence may play a pivotal role in enhancing the adolescent physiological individuation and autonomy process.

Le Grange et al. (Anderson et al., 2017) also conducted a small study examining the feasibility of delivering FBT via a Telehealth platform with good results. As online-based platforms for delivering or augmenting treatment grow in popularity, research continues to test how treatment can be delivered most effectively for patients (Davis & Attia, 2019).

However, even if these modalities have been widely evaluated and there are studies which show better efficacy than other treatments in AN (Fisher et al., 2019) and also on ARFID (Lock et al., 2019), a significant number of patients do not respond well to this treatment. Across all studies, remission rates are still under 50% 12 to 18 months after the start of treatment. Some families (patients and/or parents) seem reluctant to accept a single-family therapy project, probably because they fear that their family functioning will be challenged or because of an excessive closeness in the therapeutic or family relationships. And even if it is accepted, the single-family therapy approach can fail, particularly as a result of strong resistance to change, substantial family dysfunctions, or serious individual pathologies (Carrot et al., 2019).

Multi-family therapy (MFT) consists in bringing several families together (generally four to seven) faced with the same pathology (psychiatric or physical) in order to create a therapeutic framework and a social network, or "care community." This method was adapted for adolescents with AN and their families (Marner & Westerbergf, 1987) and manualized several years later by the Maudsley team as an intensive outpatient treatment (Eisler et al., 2003; Voriadaki et al., 2015).

The French group of Godart hypothesize that MFT is at least as efficacious as SFT, but at a lesser cost (Carrot et al., 2019). The identification of possible preferential indications for each technique could help the improvement of therapeutic indications for adolescents suffering from AN and contribute to the earliness of intervention, which is associated with a better outcome.

Other family therapeutic approaches have also shown good evidence of effectiveness: this is the case of the **Adjunctive Family Therapy** such as an integrated family therapy with a strong systemic heart and influences drawn from psychodynamic and attachmentist theories created by the French group of the Montsouris from Paris (Godart et al., 2012).

This latter model of family therapy is based specifically on the intrafamily relationships and on adolescence issues instead than on the eating behaviours. Accordingly, this family therapy focused not only on issues in the here-and-now, but also on unresolved issues from the past, as well as on expectations of how these might impact the future. Sessions focused on the familial dynamic as a whole. The sessions included the patient, her parents, and her siblings if they were over the age of 6 and living in the home. They lasted approximately 1h 30min and took place every three or four weeks for a period of 18 months.

This intervention proved to be effective in reducing feeding symptoms and in improving the general psychopathological functioning, as measured by the Morgan–Russel Outcome Assessment Schedule (MROAS) (Morgan & Hayward, 1988) adapted to adolescent patients (Jeammet et al., 1991).

These results support the hypothesis that the recovery from anorexia may benefit from an improvement of the family functioning, and focus attention on the prognostic family factors that can influence the treatment outcome (Ciao et al., 2015; Wallin & Kronvall, 2002).

Although it is well known that different family treatments have proved to be highly effective in dealing with anorexia, the functioning mechanisms of such therapies and the specific family dynamics which the treatment should more fruitfully address are still potentially fertile areas that need to be explored (Wallin & Kronvall, 2002).

Observational studies of family dynamics might be the first attempt in this direction, giving the possibility to derive clinical implications, which subsequent controlled studies will support or falsify (Mann, 2003).

6. Prioritizing Family-Centered Mental Health Care

The present study

(*Rogantini C. et al., Prioritizing Family-Centered Mental Health Care for Pediatric Patients with Eating Disorders. JAMA Pediatrics Online ahead of print; 2020*)

There are different approaches to request by families, how different the sending subjects can be, as well as the reasons. It is possible to meet families at the first experience with a hospital who realize by themselves or through the pediatrician's suggestion that their daughter's relationship with food is out of control and therefore make an urgent visit; or, in more serious cases, it is the doctor of the ER of the pediatric hospital who calls us after he has met the patients in urgency due to a failure of vital functions caused by weight loss. Other families, on the other hand, are veterans of previous therapeutic attempts that have not been successful.
Each of these situations, of course, brings several different symbolic meanings to clinical attention that will be useful for initiating and conducting care.

As indicated by the main international guidelines (American Psychiatric Association, 2006; National Institute for Clinical Excellence (NICE), 2017), the care of people with REDs must be entrusted to a multi-professional team composed of various specialists, representatives of medical, social and rehabilitation disciplines.
Our team is founded primarily on the collaboration between neuropsychiatry and the figure of the dietician and dietician or pediatrician. This condition is almost essential in cases of REDs, when it is the health of the body that is concretely at risk.
The Neuropsychiatric (NP) team is made up of an expert neuropsychiatrist, a resident neuropsychiatrist, psychotherapist psychologist, a therapist for psychiatric rehabilitation and / or an educator, possible maternage, nurse on shift.
Each professional provides his own specialist advice and the work on the patient is based on the synergy between the various professional figures: the diagnostic elements and the therapeutic objectives are continuously reworked and modulated with respect to the conditions of the patient in charge in weekly team meetings and moments of supervision.

On a diagnostic and therapeutic level, the group of professionals elaborates a specific project which is the product of the different perspectives involved in the knowledge of the

patient. The biographical narrative, medical-internal conditions, psychic resources, and socio-family background intersect in a broad integrated reading of the case, in the absence of role hierarchies.

This is the starting point for the continuous negotiation and sharing of objectives, necessary actions in the therapeutic path and in the choice of interventions to be implemented.

Evaluating if it is possible to constructively involve the family in the treatment is indeed a mandatory step in order to avoid a failure of the treatment, caused primarily by an inappropriate or premature therapeutic choice (Espie & Eisler, 2015; Herpertz-Dahlmann, 2015).

Treatments often need to be tailored not only to the patient but also to each family's needs (Diamond-Raab & Orrell-Valente, 2002; Gatta et al., 2010, 2014; Mannarini & Boffo, 2013).

Although being the therapeutic first choice in restrictive eating disorder, the systemic approach was demonstrated to be not always effective, especially in the cases where it is not possible to constructively involve the family in the treatment (Espie & Eisler, 2015; Herpertz-Dahlmann, 2015). On the other hand, if the family relationships are too dysfunctional, the individual psychotherapy can achieve only partial results.

Based on these premises, our model of psychiatric care includes:

- **individual psychotherapy**
- **intervention on the parental role**
- **triadic or family intervention**

The team that intervenes to welcome the voice of the patient and his/her parents is first of all differentiated and composed of different figures:

- One for the patient
- One for the parents
- Two for the family

In order to create a differentiating function within the family and the bonds between the adolescent and his parents in an active way and from the beginning of work.

The problem of entanglement, typical of family situations in which an eating disorder occurs, first of all needs to think of a clinical response capable of offering separate spaces, rooms with closed doors in which separation and differentiation are symbolically represented.

Such a team is proposed as a new possible identification model, performing the function of an articulated container, able to integrate the differences within it and to provide a reflection on the possibility that differentiation can constitute, as well as an incontrovertible data reality, a precious resource.
The therapeutic project is defined starting from the themes that emerged from the psychodiagnostic phase, which has as its purpose the historical reconstruction of the adolescent life context, the definition of psychic development and functioning and the indication of a possible drug therapy in case of comorbidity.

The clinical and test protocol is composed of open interviews, semi-structured questionnaires and interviews and projective tests. Projective tests are useful to reach the deepest representations and experiences that the power of the defenses does not allow to intercept through open individual interviews. Our protocol in the box below.

Patient	Parents	Family	MD/ Psychologist
YSR	CBCL	FACES-IV	LTPc
CAARMS		TAS	CGI
EDI-3		K SADS	CGAS
WISC-IV		BDI	MROAS
TAT		BAI	
R-PAS			

The offer that is immediately proposed to young patients is to build an alliance with the anorexic symptom considering the importance and solemnity of its symbolic value, or its wealth of emotional, affective, and relational meanings.
The evolutionary balance translates symptomatic behaviors into affective meanings, establishes the alliance that allows the start of the therapeutic-rehabilitation phase, allowing the formulation of a targeted therapeutic proposal.
Interpreting REDs in an evolutionary key means relating them to the developmental tasks of the different stages of adolescence and considering them as an expression of an evolutionary stalemate rather than of psychopathology. From this perspective, the

therapeutic process should not be understood as a cure but as a support to the process of subjectivation.

Individual psychotherapy

Our intervention is represented by a Psychodynamic therapy (PDT), which is one of the oldest and most widely used models of psychological therapy (National Collaborating Centre for Mental Health (UK), 2004). It should be noted that the absence of manualization and standardization (as opposed to cognitive-behavioral models) makes it difficult to publish scientific papers, such as controlled trials; in the face of the lack of extensive literature on its efficacy, however, the frequent positive clinical results on patients treated according to this orientation are emphasized.

Indeed, in our review of the literature, there is strong evidence that it can contribute to the recovery of patients affected by anorexia nervosa. In particular, in a recent study the greater efficacy of psychodynamic therapy compared to nutritional counseling is highlighted (Fonagy, 2015), while a controlled and randomized study conducted in 2001, which compares PDT with family therapy, analytical cognitive therapy and routine treatment of AN, shows that PDT determines a greater improvement (52%) compared to standard treatment (21%), but nonetheless comparable to that of family therapy (41%) and analytical cognitive therapy (32%) (Dare et al., 2001).

Jeammet and Corcos use psychodynamic psychotherapy in patients with REDs by associating it with the concept of dependence that these patients have towards food and the family context and underlining the need for patients to develop greater autonomy and maturity in interpersonal relationships. Psychotherapy plays a fundamental action on vulnerability factors such as depression; it helps adolescents to resolve the conflict of dependence / autonomy and the need for others, as opposed to self-affirmation (Corcos & Jeammet, 2001). Jeammet himself presupposes the use of different techniques relating to psychoanalytic therapy such as psychodrama, bifocal therapy, group therapy, although the indication for individual psychotherapy refers to the first indication at least at the beginning (Corcos & Jeammet, 2001). Balottin et al (Lanzi et al., 1992) also underline how, in subjects in developmental age, the psychodynamic approach, extended beyond the period of hospitalization and accompanied by a weekly interview with the family, always with a psychodynamic orientation, is associated with an extremely positive prognosis. Patients are confronted with their internal contradictions, painful thoughts, their desires, learning to

accept them without feeling overwhelmed or upset and acquire an awareness that makes them less dependent on the need to meet the needs of others at the expense of their own.
In the context of the individual intervention, it seems interesting to mention the work of Fitzpatrick et al. (Fitzpatrick et al., 2010) who described the model of Adolescent Focused Psychotherapy (AFT) that is a manualised version of ego oriented individual therapy (EOIT), who also inspired our intervention model. This method's aim is to address core deficits in development associated with REDs; the focus is primarily on self-exploration and development and the ways in which concept of self plays a role in the maintenance of disease-specific factors. In this line, adolescents with REDs, especially AN, are viewed as using food and weight to avoid negative affective states associated with developmental issues that they perceive as intolerable. In withdrawing from the environment and situations which provoke distress through self-starvation and preoccupation with food and weight, emotional and psychological development is arrested. To develop a more constructive coping style and improve self-efficacy, adolescent patients need to learn to identify, define and tolerate emotions.

Intervention on the parental role

If we assume the hypothesis that eating disorders are destabilizing for family functioning and that powerful affective and relational dynamics originated and developed within the family also contribute to the construction and maintenance of the symptom, it is not possible to carry out a clinical effective job, without the active participation in diagnostic-therapeutic work by both parents. Moreover, in line with the literature, we consider crucial working also with the parental couple alone, not conducting couple therapy, but with a view to working on their own emotionality and parental role in order to pursue the best outcome for patients. (Duclos et al., 2018; Hughes et al., 2015; Lafrance Robinson et al., 2016; Strahan et al., 2017).
Our model provides that parents are involved in a massive and continuous way both in the consultation phase and in any therapeutic taking charge, and also provides that each can be relocated to their own dimension and give voice to their own system of specific representations.

Regarding hospitalization, the methods of assistance for patients have been debated for years in relation to contacts of patients with their parents.

Marce is the first to communicate the virtues of isolation, in 1859, at the meeting of the Medical-Psychological Society, he presented a document entitled "Note on a form of hypochondriac delirium consecutive to dyspepsia and characterized mainly by the refusal of food". In this presentation, he reported observations, for example, relating to a 19-year-old girl in whom any rapprochement with her mother caused aggravation, to a 14-year-old girl who worsened in a family environment.

Charcot wrote in 1890: “Patients are placed under the supervision of qualified and experienced people: they are usually religious who have become very skilled in the management of this type of sick following a long practice. A benevolent but firm hand, a lot of calm and patience are the prerequisites in such ailments. Parents are systematically removed until a noticeable improvement is observed, following which, patients are allowed, as a reward, to see them, first with long intervals, then more and more frequently, as the recovery progresses".

Many years later, Jeammet and Corcos, in their Paris clinic, worked on the separation of patients from their parents with a therapeutic meaning during hospitalization. The concept of dependence that the patients have towards food and the family context and the need for patients to develop greater autonomy and maturity in interpersonal relationships is a key of this treatment process. Physical separation can allow patients and parents to work on the psychological separation in order to promote separation-individuation process.

In 2000, however, Marie-France Le Heuzey made a communication concerning a resistant case with high severity, treated without results with the traditional method of separation from the parents. The patient improved instead, following a hospitalization without isolation and in which family therapy was performed. Within the French hospital care unit of the Yon group, an integrated approach is proposed that includes medical care, nutritional assistance, and psychological assistance, as suggested by NICE without systematically separating the patient from his family. Furthermore, family therapy or family counseling are offered to families. The goal of this approach is to support parents, provide psychoeducational guidance and help the family acquire new behaviors and new ways to understand the eating disorder (Yon et al., 2009). Current approaches seem to support this latest model and most clinicians are opposed to an aggressive and clean separation from the family during the hospital stay.

In our methodology, the hospitalization, has the ambitious aim of introducing in the family the possibility of experiencing in a concrete way the presence of a different voice, willing to

offer different points of view and elements of rift with respect to the indistinct nature of the anorexic bond.

For this reason, after a few days in which the parents, in turn, stop in the ward for continuous assistance, we favor a progressive and gradual detachment provided that the parents remain a constant presence even if limited in time.

In our opinion, the hospitalization experience also aims to show patients that they may be able to distance themselves from their parents and find their own autonomy and independence, and even make friends with other adolescents of their own age.

In particular, in all different settings of care of our center, we realize a work with the parental couple. Starting from the first interview, which takes place with both parents, it is possible to observe the dynamics staged, accept the parents' question, formulate the first hypotheses, and build the draft of a shared consultation project, also with respect to the need to separate more or minus the patient from her parents during hospitalization.

Maternal role and paternal role are at the center of clinical interest, not only during the interviews carried out in the diagnostic phase but also during the continuation of the support intervention for parents in the rehabilitation phase.

The rehabilitation work focuses on compliance, provided a psycho-pedagogical intervention, and acted in support of the maternal and paternal roles, expression and understanding of one's own and others' emotional states, and worked to facilitate the process of separation and individuation, both by the adolescent but also by the parents (Duclos et al., 2018; Hughes et al., 2015; Strahan et al., 2017).

The work on supporting the parental role and takes place in an intermediate space, between the psycho-pedagogical intervention requested by the parents in order to identify the most appropriate strategies to counterbalance the rigidity of the anorexic / bulimic symptom, and a therapeutic intervention perhaps not directly requested. However, this intervention can be the background to the answers to the behavioral questions of mothers and fathers. Parents often ask "what to do", how to intervene during meals, in managing daily coexistence with daughters who are now struggling to recognize and who tyrannize everyone with their own need for control.

The concrete dimension of "doing" sometimes seems the only possible one for these parents, in the face of fatigue or the inability to think and tune into their own affections and those of their daughters.

When intrapsychic problems are expressed through the food symptom, the difficulty of mentalizing and attributing meaning to experiences and behaviors constitutes an element of unity between parents and children.

In addition to the couple's interviews, individual meetings are sometimes offered for parents, based on the clinical needs and specificities of the parents and families. Also according to clinical indications, both in the diagnostic and therapeutic phases, joint meetings of parents and patients can also be provided.

Triadic or family intervention

Our work is inspired by an important study (proposed by the French group of Montsuris in Paris) that has highlighted that family therapy, not focused on food aspects (e.g., FBT), but on intrafamily dynamics would be more effective in terms of body weight, menstrual status and improvement of the overall clinical picture assessed by the Morgan and Russell scale.
In our center, in addition to individual work and that with the parental couple, work on the triad is associated. Work on the family has a double value, both clinical and research, through the application of the LTPc as seen before. Indeed, a video feed back session is scheduled to follow in the presence of parents and patient with the purpose of:

• promoting positive parenting

• promoting observational skills, especially those necessary to grasp the interpersonal relationship

• promoting empathy towards children

• carrying out psychoeducational interventions based on collaboration with the expert, defining a working alliance

In the rehabilitation phase, psychological interviews for the whole family are planned every two weeks with the following objectives according to Godart, et al. (2012):

- build and maintain the therapeutic alliance;
- identify areas of specific responsibility of the adolescent and define the existing intergenerational boundaries between patient and family;
- promote the acquisition of skills that allow to protect, contain and provide support to the family unit;
- allow adequate expression and management of family conflicts;
- allow the family to rediscover its own resources and strength;

- rebuild family identity as a community;
- allow the development of the patient's individual autonomy.

The study of Godart et al. (2012) showed that, in adolescents with AN, a family psychotherapy treatment focused on family dynamics (with the characteristics described before) is potentially able to improve the outcome of these patients considering a follow-up period of 18 months. In fact, the achievement of an adequate body weight and the reappearance of the menstrual cycle occurred with a greater frequency in the group of patients undergoing this family therapy, in contrast to the traditional FBT, although the therapy was not focused on the symptoms directly related to the food dynamics.

Others rehabilitation interventions

The intervention of **psychiatric rehabilitation** therapists and educators is also fundamental to our treatment model. These professionals extract the potential of the individual, favoring the expression of faculties and subjective attitudes. Pedagogical competence contributes to transforming subjective experience into conscious, intentional, and planned, thus favoring the development of new ways of relating, more closely related to the reality and context in which one lives. Free time becomes opportunities for experimentation, aggregation, confrontation, and confrontation even within the dimension of play and fun. The rehabilitation role is not exclusively linked to the achievement of measurable and quantifiable treatment goals, but also to the playful dimension of everyday life.

The interventions offered are integrated both psychodynamic and cognitive.

The goal is to offer an approach centered on the person as a whole that provides for the recovery of one's body and psychological well-being. The offer includes:

- motivational interviews to the treatment path
- meal assistance and work after the meal such as emotional food diary
- Verbal activities: e.g., information talks and sharing of the crisis, management plan
- Psycho-expressive and psycho-educational activities: emotional literacy group, art therapy workshop, creative writing workshop, cineforum and music therapy group, discussion group on newspaper articles or magazines or autobiographies, cooking class, playful activities
- Psycho-corporeal activities: psycho-corporeal group, laboratory of Body Self Care, mindfulness, progressive relaxation, and guided meditations.

Finally, a few words about drug treatment. Although there are no drugs for the core symptoms of the disorder, not infrequently the NP and the nurses are subjected to pharmacological requests underlying almost magical expectations: the drug is in fact often interpreted by the patient as an immediate solution to every penalty. On the contrary, some patients are almost persecutory worried and fear the medicines could change them in body or in mind.

In our model, in an attempt to accompany the patient to a resolution of the malaise that provides for a minimum tolerance and that contemplates the questioning of subjective pain, placing the emphasis on the real and contextual causes of the demand, the drugs are agreed and supplied only after the failure of speech and relationship-based strategies.

The drug is not the solution, but one of the tools that, making suffering more tolerable, allow the patient to linger and reflect on the meanings of his mental illness, causing him to be more aware and motivated in facing his own therapeutic path. With respect to the molecules used, some evidence are present regarding the use of olanzapine in restrictive eating disorders (Crow, 2019). Alternatively, any comorbidity is a treating target.

6.1 Integrated multi-professional triadic treatment: triadic functioning before and after a 6-month treatment period

It is well established that family therapy models work, but it is still unclear why they work, and if there are specific family dynamics to be targeted and modified to facilitate a positive outcome for the patient. Studies on interactive processes in these families may help to clarify the issue (Wallin & Kronvall, 2002; Wallis, Miskovic-Wheatley, et al., 2017).

Treating this serious and potentially deadly psychopathology in a timely and effective manner can therefore be crucial (Vall & Wade, 2015) and research in this field can substantially increase the range of available interventions and the effectiveness of their application in different clinical situations.

The present study

(Mensi MM et al., non-yet submitted)

The aim of the present study is to:

explore the presence of pre-post significant variations in the triadic functioning in families of adolescent patients with severe RED who were received six (±two) months of our multi-professional intervention.

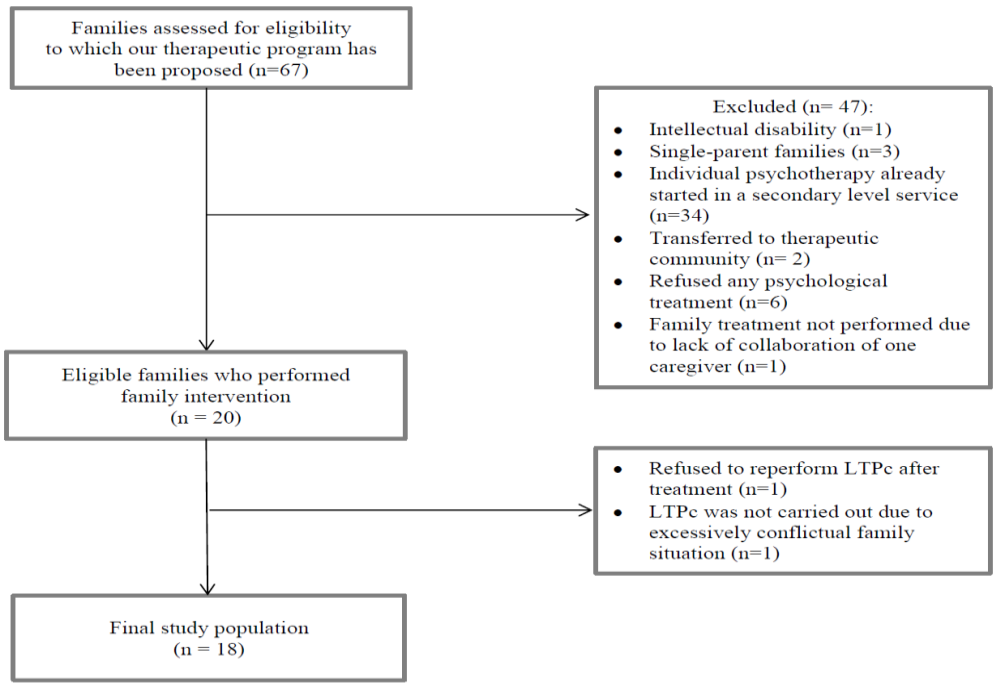
The triadic functioning was assessed before and after the intervention with the clinical version of the Lausanne Trilogue Play (LTPc) (Malagoli Togliatti & Mazzoni, 2006).

Understanding how this intervention may affect triadic functioning after a relatively brief period is key and preliminary to plan appropriate clinical trials that may further address the efficacy of this intervention. Moreover, the findings may also inform other family-centred approaches as they are warranted to provide insights on the aspects of triadic relationships that may be more open to therapeutic modifications in the first months of the healthcare journey of adolescents with severe REDs.

Materials and Methods

Population

Sixty-seven families of adolescent patients diagnosed with REDs were assessed for eligibility between July 2017 and October 2020 at the Child Neurology and Psychiatry Unit of the IRCCS Mondino Foundation (Pavia, Italy). Selection was based on the following inclusion criteria: age between 11 and 18 years (extremes included) and a diagnosis RED (including AN or other related conditions, such as ARFID, atypical anorexia nervosa and unspecified feeding or eating disorders with restrictive characteristics). All the diagnoses were done according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria (American Psychiatric Association, 2013). The patients were excluded from the study if they presented at least one of the following criteria: diagnosis of psychotic disorders prior to the enrolment, intellectual disability, neurological pathologies (e.g., epilepsy), or other psychiatric comorbidities with organic substrate (e.g., LES). Moreover, we also excluded single-parent families and individuals with less-than-optimal mastery of Italian language. Finally, we excluded patients who were already receiving psychotherapy in a secondary level service not to interrupt/modify therapies already in progress and to preserve therapeutic continuity. The study received the approval of the Ethics Committee of the Policlinico San Matteo (Pavia, Italy). All the procedures are consistent with the principles of the World Medical Association Declaration of Helsinki (1964) and its later amendments. All the enrolled patients and their parents provided written informed consent to participate in the study. Figure below illustrates the flow diagram of participants' selection.



Procedures

Patients might be hospitalized, in day hospital care or they were following outpatient treatment. The patients were interviewed by a trained child neuropsychiatrist to collect clinical and socio-demographic data. To confirm appropriate RED diagnosis and exclude the presence of any comorbidities, the semi structured DSM-based K SADS interview (Kaufman et al., 2016) was conducted with the patients and their caregivers. To assess the presence of personality disorders, patients were administered the SCID-5 PD (First et al., 2017). Furthermore, we assessed the presence of intellectual disability among patients by administering the most age-appropriate Wechsler intelligence scale, WISC-IV (Wechsler, 2003) or WAIS-IV (Wechsler, 2008). To evaluate triadic functioning, families participated in a videotaped play session according to the LTPc (Malagoli Togliatti & Mazzoni, 2006), which was performed at baseline (time 0, T0) and after six months (± two) of treatment (time 1, T1). Every session was videotaped in a separated room and coded by two independent judges, specifically trained.

Treatment

Our team designed a multi-dimensional care program (for details see previous chapter), as indicated by the main international guidelines (American Psychiatric Association, 2006; National Institute for Clinical Excellence (NICE), 2017).

The care of patients affected by REDs is entrusted to a multi-professional team composed of different specialists, representatives of medical, social and rehabilitation disciplines. Our team is founded primarily on the collaboration between neuropsychiatrists and dieticians. This condition is almost essential in cases of REDs, as body health is often severely at risk. The Neuropsychiatric team is made up of an expert neuropsychiatrist, a resident neuropsychiatrist, psychotherapists, a therapist for psychiatric rehabilitation and/or an educator and a nurse.

On diagnostic and therapeutic level, the group of professionals elaborates a specific project which is the product of the different perspectives involved in the knowledge of the patient. The biographical narrative, medical-internal conditions, psychic resources, and socio-family background intersect in a broad integrated reading of the case, in the absence of role hierarchies. This is the starting point for the continuous negotiation and sharing of objectives, necessary actions in the therapeutic path and in the choice of interventions to be implemented.

Based on these premises, our model of care includes:

1) individual psychotherapy according to Fitzpatrick model (Fitzpatrick et al., 2010);
2) intervention on parental role (Duclos et al., 2018; Hughes et al., 2015);
3) triadic intervention oriented according to Godart model (Godart et al., 2012).

Adolescent patients underwent individual psychodynamic psychotherapy once a week, based on the manualized adolescent-focused psychodynamic therapy, whose efficacy has been documented in the treatment of AN (Fitzpatrick et al., 2010).
Intervention with the parental couple, which took place weekly with the couple alone or in groups of parents, focused on compliance, provided a psycho-pedagogical intervention, and acted in support of the maternal and paternal roles, expression and understanding of one's own and others' emotional states, and worked to facilitate the process of separation and individuation, both by the adolescent but also by the parents (Duclos et al., 2018; Hughes et al., 2015; Strahan et al., 2017).
Work on the triad had a double value, both clinical and research, through the application of the LTPc as seen before. In this line, as first therapy session, a video feedback session was scheduled in the presence of parents.

Triadic intervention was planned every two weeks and conducted by two trained psychologists with the parental couple and the adolescent, with the following objectives according to Godart, et al. (2012):

- To build and maintain the therapeutic alliance.
- To identify areas of specific responsibility of the adolescent and define the existing intergenerational boundaries between patient and family.
- To promote the acquisition of skills that allow to protect, contain, and provide support to the family unit.
- To allow adequate expression and management of family conflicts.
- allow the family to rediscover its own resources and strength.
- To rebuild family identity as a community.
- To allow the development of the patient's individual autonomy.

Besides triadic therapy, a nutritional counselling and a neuropsychiatric monitoring were conducted, to supervise the progress of eating disorder features over time and monitor any pharmacological therapy based on the comorbid symptoms (e.g., depression or anxiety).

Measures: *The Lausanne Trilogue Play in its clinical version (LTPc)* (Malagoli Togliatti & Mazzoni, 2006) (for details see previous dedicated chapter)

Statistical Analyses

We conducted analyses using IBM SPSS Version 21 for Windows. Descriptive statistics have been assessed for each variable. To test for stability, we adopted mean-level change method (Ashton, 2017) and rank-order consistency method (Roberts & DelVecchio, 2000). To assess differences for normally distributed variables we used paired sample *t*-test, and Spearman correlation coefficient (*r*) was used to assess correlations involving ordinal variables.

Results

Eighteen adolescent Italian girls from 11 to 17 years old (M=14.64, SD=1.47) participated in the study with their families. 11 girls were from [edited out for blind review] (61.11%) and 7 from [edited out for blind review] (38.89%). Their average BMI at baseline was 13.1 (SD=18.74) (lower 11.9 – higher 32.1). Only 2 out of 18 parental couples were divorced (11.10%).

Most patients were diagnosed with AN (72.22%), and the rest of the sample received a diagnosis of another RED (ARFID, atypical anorexia nervosa, unspecified feeding or eating disorder with restrictive characteristics). Regarding comorbidities, some patients were diagnosed with the following conditions: schizophrenia, diagnosed in 5.56% of the sample, depression in 55.56%, anxious disorders in 5.56% and personality disorders in 11.10%.

No patient before baseline were on a controlled dietary program, whereas at T1 16 of 18 patients were also nutritionally supported (88.89%). At baseline, 16 patients (88.89%) were already undergoing individual therapy, 14 parental couples (77.78%) were undergoing couples therapy and 14 families (77.78%) participated in triadic therapy. In our clinical practice, patients and families who do not have an established psychotherapy in a secondary level service, at the same time as they undergo the assessment process (which is carried out within a maximum of two weeks) undergo psychotherapy with our practitioners; therapy had started favorably with our team at the time of completion of the diagnostic assessments for most families.

At T1, all patients took part in individual therapy, while two more parental couples started to follow the therapy (88.89%) and at T1 percentage remained the same regarding triadic therapy.

The average girls' BMI after the treatment was 14.4 (SD=22.72) (lower 13.0 – higher 31.4).

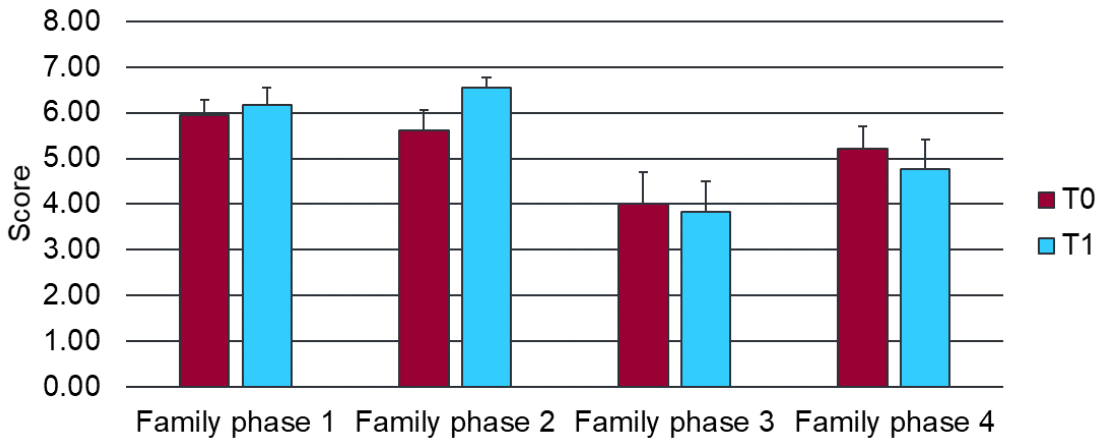
Clinical characteristics of the sample are reported in Table below.

Diagnosis	**N**	**%**
Eating disorders		
Anorexia	13	72.22
Unspecified REDs	5	27.78
Schizophrenia		
No	17	94.44
Yes	1	5.56
Depression		
No	8	44.44
Yes	10	55.56
Anxious disorders		
No	17	94.44
Yes	1	5.56
Personality disorders		
No	16	88.89
Yes	2	11.11

T0 therapies	**N**	**%**
Patient, individual		
No	2	11.11
Yes	16	88.89
Parents, couple		
No	4	22.22
Yes	14	77.78
Triadic therapy		
No	4	22.22
Yes	14	77.78
T1 therapies (all sessions completed)	**N**	**%**
Patient, individual		
No	0	0.00
Yes	18	100.00
Parents, couple		
No	2	11.11
Yes	16	88.89
Triadic therapy		
No	4	22.22
Yes	14	77.78
Dietary program		
No	2	11.11
Yes	16	88.89

LTP T0-T1 mean comparisons

We found a statistically significant change after the treatment only in family phase 2 (father-daughter), $t(17) = -2.36$, $p = .030$ (see Figure below).



LTP T0-T1 correlations

Correlations between family scores between T0 and T1 were not statistically significant in phase 1 (r=0.420, p=0.083), phase 2 (r=0.437, p=0.070), phase 3 (r=-0.028, p=0.912), but were statistically significant in phase 4 (r=0.477, p=.045).

As for the patients alone, we did not find significant correlations between T0 and T1 in Participation (r=0.373, p=0.128), and Affective contact (r=0.436, p=0.070) scores. We find statistically significant correlations in Organization (r=0.702, p=.001), and Focal attention scores (r=0.643, p=.004).

As for fathers, we found statistically significant correlations between T0 and T1 in Participation (r=0.576, p=0.012), Organization (r=0.558, p=0.016), and Focal attention (r=0.470, p=0.049) but not in Affective contact (r=0.318, p=0.199) scores.

In addition, mothers showed a lack of stability between T0 and T1 in Participation (r=0.302, p=0.223), and Affective contact (r=0.465, p=0.052), while Organization (r=0.488, p=0.040), and Focal attention (r=0.567, p=0.014) scores were statistically significant.

Discussion and Conclusions

The aim of the present study was to describe changes in triadic functioning among families of adolescents suffering from REDs across a multi-professional six months (±two) intervention.

Our study showed a significant modification in LTPc family phase 2 scores, phase in which the father is supposed to play with the daughter while the mother plays the role of a silent observer. This may imply that when fathers took on an active role, they managed to improve the dyadic family functioning. This finding is also consistent with some previous pioneering studies stating that encouraging paternal involvement can improve treatment outcomes (Couturier et al., 2013; Horesh et al., 2015).

Fathers usually assume a disengaged role with respect to the REDs family. This paternal weakness may stand for a defensive reaction in front of the daughter's illness, but at the same time it may entail a less affective connection and it can influence the quality of family interactions and the REDs outcome (Balottin et al., 2014; Mensi et al., 2020). It can be supposed that fathers consequently benefit from our intervention more than the remaining members of the triad as the treatment allows them to assume a more

emotionally involved role, leading to an important change in the dyadic family functioning.

In line with the current literature (Duclos et al., 2014; Godart et al., 2012), the results of our study might therefore support the clinical indication to tackle the emotional contact and to promote the father's participation in the mother–daughter relationship. A growing body of literature indeed indicates that therapeutic approaches to severe REDs in adolescence should include the paternal participation (Couturier et al., 2013; Horesh et al., 2015; Jones et al., 2006), as well as the maternal one, in the treatment of the adolescent, thus favoring the parental alliance and the triadic interactions. Paternal involvement and warmth in fact prove to be fundamental for the outcome and those fathers who tend to slip away and remain emotionally and concretely excluded need to be encouraged and supported (Godart et al., 2012; Hay et al., 2014; Horesh et al., 2015).

We did not find a similar modification regarding mothers after the treatment. As pointed out by previous studies (Anastasiadou et al., 2014; Kyriacou et al., 2008; Whitney et al., 2012), mothers are usually more involved in their daughters' affliction than fathers that are more critical. It can be supposed that mothers should need a more prolonged family treatment to change these dysfunctional patterns. However, it is possible to advance the hypothesis that if fathers have been able to demonstrate a more active role, perhaps it is also because mothers have been able to give more space to the father figure.

Likewise, our study did not provide a significant change in the whole triadic functioning. We can assume that a six-month treatment is not sufficient to modify interactions at the triadic level, since dyadic levels are overly compromised in our adolescent sample, which presents a psychopathological picture so severe that it has led them to a tertiary care service. With regard to the absence of significant changes in phase 4, we underline that we have not carried out interventions on the couple as such but only on the parental role.

Furthermore, the present study unveiled a good stability between pre- and post-treatment scores considering LTPc functional levels organizations and focal attention for parents and patients.

Precisely because the patients' conditions are so severe and the duration of treatment is relatively short, we can see that their level of organization showed the most statistically significant stability among all functional levels. Globally, for all members the therapy is not able in such a short time to modify a level that corresponds to the role function, which is so deep and structured.

The level of focal attention it implies the ability to focus on the same goal and to share the significant with non-verbal language with all family members. It therefore represents a measure of the ability to triangulate. We can therefore expect that this ability is still fragile after 6 months of treatment as a measure of good triadic attunement.

Contrariwise, the present study unveiled a lack of stability between pre- and post-treatment scores considering LTPc affective contact. Usually in families of severe patients with REDs, traits of alexithymia are frequent especially at the first observation (Gramaglia et al., 2020) and/or members could express false positivity such as avoidance of conflict (Minuchin et al., 1975; Selvini Palazzoli, 1979). The presence of both positive and negative emotional expression allows a change in the LTPc score which could explain the lack of stability of this score. Clinically we interpret emotional expression as a positive therapeutic modification.

Regarding participation, for the patient and for the mothers we note a lack of stability, indicating a change with the therapy, although not significant, of their willingness to interact triadically. On the other hand, for fathers, participation shows a good correlation, pre- and post-intervention. This data underlines what we have said previously: it is fathers' affective connection that can influence the quality of relations and change family interactions and the REDs outcome.

We can hypothesize that our triadic intervention model has changed the evolutionary trajectory of each family. This feedback leads us to underline the importance of taking care of the whole family during the treatment of REDs (Couturier et al., 2013; Fisher et al., 2019).

We strongly suggest that a therapeutic approach that guarantees three settings (individual therapy, support for the parental role and triadic intervention) could therefore respond to the needs of the most severe patients who come to a tertiary care service and who require a more intensive treatment during the first phase of the care process.

Considering the different developmental trajectories of patients affected by these disorders, after the first phase of therapy, for some of them it is essential to work on the triad while for others an individual psychotherapy is more appropriate and a separate space for parents is mandatory to work on the separation-individuation process.

By means of the LTPc procedure, clinicians could shed a light not only on family difficulties, but also on their strengths in order to decide which type of intervention is the

most suitable, with the aim of improving the prognosis of disorders that frequently tend to persist and be really invalidating (Mensi et al., 2020). In addition, performing LTPc at T1 is also useful to assess whether to continue the current treatment or to direct each family to the most appropriate treatment, perhaps recommending fewer intensive treatments and avoid investing economic resources in unnecessary therapies, as some authors suggest (Carrot et al., 2019).

Our study has some limitations. The first one is represented by the relatively small sample size, conditioned by the need to include only triads that accepted our intervention. This is a factor that may limit our ability to generalize about the results and underline the need to extend the sample size to confirm these results on a wider population. Secondly, we focused on REDs, excluding other disorders such as bulimia nervosa or binge-eating. Future studies may investigate whether our results are also applicable to other eating disorders.

Treating this serious and potentially deadly psychopathologies in a timely and effective manner can be crucial (Vall & Wade, 2015) and research in this field can substantially increase the range of available interventions and the effectiveness of their application in different clinical situations. Observational studies of family dynamics might be the first attempt in this direction, giving the possibility to derive clinical implications, which subsequent controlled studies will support or falsify (Mann, 2003). Evaluating if it is possible to constructively involve the family in the treatment is indeed a mandatory step in order to avoid a failure of the treatment, caused primarily by an inappropriate or premature therapeutic choice (Espie & Eisler, 2015; Herpertz-Dahlmann, 2015).

Given the ability of the present intervention model to modify triadic dynamics, and of the LTPc to detect such changes, we plan to conduct case-control studies to evaluate the effectiveness of the intervention method in improving family functioning and promoting better REDs outcomes.

In addition, the aim of our future work is to use the LTPc to study the whole family, including siblings in the assessment and treatment process that is the subject of our research.

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Supplementary Materials

All Scientific Papers related to PhD work are reported below

PERCEIVED AND OBSERVED FAMILY FUNCTIONING IN ADOLESCENTS AFFECTED BY RESTRICTIVE EATING DISORDERS.

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Abstract

Objective. We aimed to underline, through self-report questionnaire FACES-IV, the presence of a typical pattern of family functioning in restrictive eating disorder patients' families and to compare parents' perceptions of their family. Furthermore, we compared these results with a rigorous standardized evaluation of family functioning (Lausanne Trilogue Play - clinical version, LTPc).

Background. The role of familiar factors in the development and maintenance of eating disorders has been extensively studied. Previous studies using LTPc underlined that families whose member is affected by anorexia nervosa show dysfunctional dynamics compared to control ones. Nevertheless, FACES-IV questionnaire, showed different results.

Method. We included 40 female adolescents suffering from restrictive eating disorders and their parents. Each parent filled in the FACES-IV and participated with their daughter in the videotaped LTPc observation.

Results. We found balanced functioning and good agreement between parents at FACES-IV. Nevertheless, LTPc results underline that parents' perception is different than the clinician's standardized evaluation.

Conclusion. Our results suggest using both self-report and observational instruments in family functioning assessment of AN patients.

Implications. Self-report questionnaire should be used to discuss with family members and to facilitate the understanding of their family difficulties, in order to improve their family functioning and patient's outcome.

Introduction

Anorexia nervosa (AN) is a serious psychiatric disorder with a prevalence ranging from 1.2 to 2.25 in females and 10-times lower in males (Jagielska & Kacperska, 2017). Partial syndromes and subclinical AN are instead more frequent: Jagielska & Kacperska (2017) suggested a prevalence between 2.4 and 4.3%. Morevoer, the time trend showed that this illness has become more common over the time (Hoek, 2016; Keski-Rahkonen & Mustelin, 2016).

The etiology of the illness is multifactorial: psychological as well as familiar, sociocultural, and genetic factors are involved in AN onset and development (Kim et al., 2011; Lock & La Via, 2015). In particular, the role of familiar factors in the development and maintenance of Eating Disorders (EDs) has been studied since times (Holtom-Viesel & Allan, 2014).

In 1978, Minuchin theorized a family model in AN, called "psychosomatic", based on enmeshment, rigidity, hyper protection and avoidance of conflict (Minuchin et al., 2014; Selvini Palazzoli, 1979). In line with this model, a review of 17 studies underlined that families of AN patients showed through self-report a significant worse functioning than controls (Holtom-Viesel & Allan, 2014). However, results are often conflicting: Cerniglia and his group (2017) underlined difficulties in respecting interpersonal boundaries, poor tolerance of conflict and low satisfaction, while Visani and Colleagues (Visani et al., 2014) pointed out that parents of AN daughters perceive their family as functional and positive.

Some studies highlighted different parents' perception on family functioning, while others found no differences between parents (Ciao et al., 2015; Criscuolo et al., 2020; Laghi et al., 2017; Ma, 2011; Wallis et al., 2018). Furthermore, numerous studies (Kyriacou et al., 2008; Whitney et al., 2012) outlined that mothers are usually more involved in their daughters' affliction than fathers that are more critical (Anastasiadou et al., 2014).

Considering that FACES-IV is largely used in clinical assessment to obtain information about family functioning and that there are not univocal results either about family functioning in AN or

about parents' agreement, our first aim is to highlight, through self-administered instruments such as FACES-IV, the presence of a typical pattern of family functioning in AN and to compare parents' perception in FACES-IV subscales, in order to point out potential differences between mothers and fathers.

Finally, we aim to compare FACES-IV with a standardized direct observation made by clinicians, the clinical Lausanne Trilogue Play (LTPc; Malagoli Togliatti & Mazzoni, 2006), in order to compare internal evaluation of family functioning made by parents with an external one. Thus using LTPc, Balottin et al. (2017) and Mensi et al. (2020) compared family functioning of patients affected by AN and family functioning of patients with emotional and behavioral disorders, concluding that triadic coordination showed by families of anorexic patients is significantly lower than in the control group. Moreover, Mensi et al. (2020) pointed out a distinctive AN profile, characterized by globally low scores in all LTPc levels, with a particular impairment in basic functional levels (participation and organization).

This result underlines that clinicians could note more dysfunctional patterns in the family, than the family members did, themselves. In line with this hypothesis, we expect that parents' perception is different from clinician's point of view because the two instruments offer two complementary visions of the same family system (Reiss, 1989; Wilkinson, 1987).

Methods

Participants

We collected data within a project named "Anorexia in adolescence: the family relations may affect the course? A clinical study on family relations for a more effective therapeutic approach" authorized in 2017 by the Ethical Committee of Policlnico San Matteo in Pavia. We recruited 40 families of patients: 18 patients were recruited at Child Neurology and Psychiatry Unit of the IRCCS Mondino Foundation in Pavia and 22 at Child Department of Neuroscience – Neurology

and Psychiatry Unit of the IRCCS Children Hospital Bambino Gesù in Rome. The patients arrived at our structures between January 2013 and September 2019. Twelve of them were diagnosed with AN and 28 of them with Eating Disorder Not Otherwise Specified (EDNOS) with restrictive behaviors, according to DSM-5 (American Psychiatric Association, 2013).

Inclusion criteria were:

- Diagnosis of restrictive ED: AN or EDNOS with restrictive behavior according to DSM-5 (American Psychiatric Association, 2013).
- Patients' age between 12 and 18 years old.
- Female sex.

Exclusion criteria were:

- Male sex.
- Participants with insufficient comprehension of the Italian language.
- Families in which there are not two caregivers, parents, or guardians.
- Diagnosis of autism spectrum disorder, schizophrenia, intellectual disability according to DSM-5 (American Psychiatric Association, 2013).

We also included families in which parents were divorced: in fact, the LTPc can be performed even though parents are no more married (Lavadera et al., 2011).

The two groups are homogeneous for patients and parents' age: patients' mean age was 14.75 years old, fathers' median age was 51.25 years old and mothers' mean age was 47.65. The two groups of patients are homogenous for BMI too and the mean is 16.46 Kg/m^2.

We also investigate the potential comorbidity through K-SADS-PL interview (Kaufman & Schweder, 2004). 77.5% of the patients had at least one comorbid condition: in particular, 30% of them had depression, 12.5% anxiety disorders and the rest of the patients had an association of ED, depression and/or anxiety and at least another psychiatry condition (psychosis, behavioral disorders,

OCD, etc.). 80% of the patients had no purging and 72.5% no binge eating, but 65% showed hyperactivity and 65% obsessive-compulsive traits.

Procedure

A child neuropsychiatric recruited patients and families in outpatient clinic, Day-hospital, or hospitalization. Families were recruited during the first day of consultation. During the clinical assessment, each patient was undergone to nutritional, psychiatric, and familiar evaluations (Zanna et al., 2017) and each parent received the FACES-IV questionnaire. The referring doctor proposed the trial to the families, giving a short description of it. Parents signed a consent for the study's participation, one for privacy and one for the video registration of LTPc. We also asked patients to sign an assent for the study. All the procedures are consistent with the principles of the World Medical Association Declaration of Helsinki (1964) and its later amendments.

Successively, the whole family was observed through the procedure of LTPc (Malagoli Togliatti & Mazzoni, 2006): every session was videotaped in a separated room and after coded by two independent judges, who have completed specific training. Judges obtained a two-way mixed ICC value of uniformity of 0.87 (excellent) made encodings for LTPc. A psychologist has entered the results in an encrypted database, ensuring the privacy of each subject.

Measures

FACES-IV (Visani, 2014)

This self-reported questionnaire was formulated by Olson and it is formed by a theoretical model of family functioning and by different operative devices, a questionnaire, and a scale for clinical evaluation, which provide a qualitative and quantitative evaluation of family functioning.

The questionnaire is composed by 42 items for balanced and unbalanced scales, 10 items for communication's scale and 10 for satisfaction.

Balanced scales are "balanced cohesion" and "balanced flexibility". These parameters are directly proportional to family's wellness: in fact, the higher the levels are, the more family functioning is directed to wellness. Cohesion is defined as "the emotive link which connects family members" (Olson & Gorall, 2006), while flexibility is "the quality and expression of leadership and organization, of role's relationships, rules, and negotiations" (Olson, 2010).

Unbalanced scales are "disengagement", "enmeshment", "rigidity", "chaos" and they evaluate extreme areas of cohesion and flexibility. The relation of these areas with family's wellness is inversely related: in fact, high levels are associated with problematic familiar styles.

Lastly, scales for family communication and satisfaction show the ability of family's members to recognize the levels of communication and satisfaction. In fact, the hypothesis underlying of these scales is that recognition of good satisfaction and communication is related to high levels of cohesion and flexibility.

Moreover, in FACES-IV there are two other measures, the ratio between balanced and unbalanced scales. In particular, ratio > 1 points for families in which balanced scales have more influence than unbalanced ones, while ratio < 1 shows families in which unbalanced scales carry bigger weight. Therefore, the higher the ratio is, the more functional family is and vice versa.

There are three different ratios, which can be calculated using the following formulae:

Cohesion Ratio = Balanced Cohesion / (Disengagement + Enmeshment)/2

Flexibility Ratio = Balanced Flexibility / (Rigidity + Chaos)/2

Global Ratio = (Cohesion Ratio + Flexibility Ratio)/2

LAUSANNE TRILOGUE PLAY

The Lausanne Trilogue Play – LTP - is an instrument created to study the family alliance. It is a standardized methodic so that it can be used for research by different authors (Stern, 1999).

The play is structured in four configurations, which are linked by transitions; each configuration gives a different point of view about the same interactions of the family. In fact, in a triangle there are four possible configurations: one, in which the three members act together and three in which two members are together and one is alone (Fivaz-Depeursinge & Corboz-Warnery, 1999).

So, the parts of the play are (Castellina et al., 2006):

Part I: two + one. One of the parents plays with the daughter and the other one assumes the role of observer, maintaining however an emphatic behavior.

Part II: two + one. In this second part parents switch their role, so that the parent, who played actively before, now is observer and vice-versa.

Part III: all together. All members must play together. This is the most complex phase, because all the participants are simultaneously active and interactive errors are more frequent. This is the phase in which the levels of coordination or competition are more visible.

Part IV: two + one. In the last part of this play, parents have to talk together, while the daughter assume the role of observer. This phase gives information about how the child accepts the exclusion and on the ability of parents to make this exclusion possible.

To reach the goal of the play, members should cooperate constantly as a team, working together both in positive and in negative moments (Fivaz-Depeursinge & Corboz-Warnery, 1999).

To evaluate how family cooperates, there is a coding system, which analyzes different aspects.

In fact, we consider four different functions for each member in every phase: participation, organization, focalization and affective contact; the coding is made through summarizing sheets and points out the behavior of each member in the phase analyzed (Castellina et al., 2006).

We used LTP version adjusted for clinical contest and for adolescence age (Malagoli Togliatti & Mazzoni, 2006). Its coding system permits to assign a score for each family member for each function in each phase and to obtain a total family score ranging from 0 to 40, helping clinicians to identify four type of family alliance: cooperative, stressed, collusive and disordered. Cooperative (32-40) and stressed (24-31) alliances are "sufficient good", because the members of the family seem to cooperate as a team: this context is positive and protective for family development and for child's adaptation. Collusive (16-23) and disordered (0-15) alliances are instead "problematic": in fact, members do not cooperate as a team and parents, acting one against other, seem to entrap their child in a deviant coalition or exclude him/her totally (Fivaz-Depeursinge & Corboz-Warnery, 1999).

Statistical analysis

To discover linear trends between variables a correlational analysis is computed: Spearman correlation coefficient is used when ordinal variables are considered, Pearson correlation coefficient when the variables are quantitative. To compare different population statistical tests are used. A preliminary Kolmogorov-Smirnov test for normality is computed. Then t-test are computed for normal data, Wilcoxon signed rank test otherwise (each test is paired if the two population are dependent, like in the mother-father comparison).

Results

Presence of typical pattern of family functioning and correlation between mother's FACES-IV and father's one

We calculated the means of mothers and fathers in FACES-IV subscales. The results and the standard deviations are shown in the following table (Tab.1):

"Table 1 about here"

Our study shows that there is a positive correlation between parents in FACES-IV subscales: in fact there is a positive significant correlation in: satisfaction score (r = 0.34; p: .032), communication score (r = 0.44; p = .005), balanced flexibility percentile (r = 0.68; p = 0), balanced flexibility range (r = 0.5; p = .011), cohesion range (r = 0.73; p = 0), enmeshment percentile (r = 0.36; p = .022), disorganization percentile (r = 0.49; p = .014), disorganization range (r = 0.57; p = .000), disengagement percentile (r = 0.41; p = .008), disengagement range (r = 0.51; p = .000), flexibility ratio (r = 0.49; p = .001), cohesion ratio (r = 0.53; p = 4e-04), global ratio (r = 0.45; p = .055).

To confirm these results and evaluate the global concordance, we used tests for paired data and we found that the following subscale have means statistically not different within the marital couple: balanced flexibility (p = 0.636), balanced cohesion (p = 0.221), enmeshment (p = 0.166), disorganization (p = 0.495), communication (p = 0.465), disengagement (p = 0.298) and ratio flexibility (p = 0.707).

Correlation between LTPc and FACES-IV

Regarding LTPc scores, the mean of the family total score is 19.68 (*SD* = 6.63) that corresponds to collusive alliance (alliances are defined collusive when the total score ranges from 17 to 23).

We related the scores of LTPc with the scores of both parents in the different scales of FACES-IV.

We found three negative correlations between mothers' perception at FACES-IV and LTPc levels. In particular:

- Total Family Organization and mothers' percentile scores in Rigidity (r = -0.45; p = .004).
- mother's organization in phase 4 and mother's percentile scores in enmeshment (r = -0.36; p = .006).
- daughter's organization in phase 4 and mother's percentile scores in enmeshment (r = -0.43; p = .006).

Regarding father's perception, the analysis showed a significant positive correlation between total family score at LTPc and father's cohesion ratio (r = 0.35, p = .026)

The analysis also showed a positive correlation between the mean of percentile scores of mother and father cohesion and total family affective contact at LTPc (r = 0.32, p = .045)

Since FACES-IV scores are percentiles between 0 and 100, in order to make interpretation easier, we divided the scores of balanced and unbalanced scales into different ranges: 0-15 very low; 16-35 low; 36-35 moderate; 66-85 high; ≥ 86 very high.

Therefore, we repeated the analysis using ranges' scores instead of percentile scores and we found the following correlations: regarding mothers' perception, a negative correlation between total family Organization and mothers' range scores in Rigidity (r = -0.54, p = .000), daughter's organization in phase 4 and mother's range scores in enmeshment (r = -0.38, p = .015). From fathers' point of view, we found a positive correlation between total family organization and father's range scores in balanced flexibility (r = 0.32; p = .042).

Discussion

Presence of typical pattern of family functioning and correlation between mother's FACES-IV and father's one

Our study showed that in parents' opinion, among families of girls with AN, there is a generally good communication, low levels of enmeshment, intermediate levels of cohesion, flexibility, and disorganization and intermediate or low levels of disengagement. This is in line with previous literature that suggests a positive parents' perception of family functioning (Fisher & Bushlow, 2015; Laghi et al., 2017; Visani, 2014).

Regarding agreement between parents, our study showed positive correlations between every marital couple. We have found positive correlations between all the subscales of FACES-IV except for the rigidity. Furthermore, as shown in table 1, we found that both perceived low levels of enmeshment and intermediate or low levels of disengagement. This is consistent with previous studies(Ciao et al., 2015; Criscuolo et al., 2020; Fisher & Bushlow, 2015; Laghi et al., 2017; Ma, 2011; Wallis et al., 2018), which showed a general agreement between family members. We also found that there is a general parental agreement in disorganization, in which the mean scores of both parents are indicative of intermediate levels, and in communication, according to previous studies (Laghi et al., 2017; Visani, 2014). Nevertheless, these results derive from a self-administered evaluation and it could be little objective, because it evaluates parents' judgments, sometimes influenced by the refusal and avoidance of the conflict, as well as by the idealization of family relationships (Casper & Troiani, 2001; Vidović et al., 2005).

Correlation between FACES-IV and LTPc

Our study shows significant correlations between LTPc and parents' perception.

We investigated the potential correlation between the ratio at FACES-IV and the scores at LTPc. However, our analysis underlines that only father's cohesion ratio is positive related to total family

LTPc score. This is in line with the construct of the ratio, that is used to evaluate if the family is oriented more to balanced or to unbalanced aspects: the higher the ratio is, the more functional the family is (Visani, 2014). This result shows that family is more functional when fathers perceive high levels of balanced cohesion, associated with low levels of enmeshment, and disengaged. In this regard, fathers demonstrate more objective perceptions than mothers: this is in line with other studies, revealing that, in families of anorexic patients, fathers tend to be more critical than mothers, who are instead overinvolved in their children suffering (Anastasiadou et al., 2014; Kyriacou et al., 2008; Whitney et al., 2012).

The fact that there are no other significant correlations between ratio at FACES-IV and levels of LTPc shows that parents' perception should be considered different from the clinician's point of view. This emphasizes that entrusting the evaluation only to a self-administered instrument is less reliable than a clinical assessment made by a professional through a standard tool. So, the LTPc becomes an essential instrument of the assessment of family dynamics in anorexic patients.

These results are confirmed also by the comparison between the total score at LTPc and the global ratio at FACES-IV.

In fact, most of our families showed a total LTPc score which corresponds to collusive alliance, which is indicative of a dysfunctional family functioning. In this type of alliance there is a not negotiated conflict between parents, who shift it on their daughters, using them as a mediator or a scapegoat (Fivaz-Depeursinge & Corboz-Warnery, 1999). This result is corroborated also by the mean of total LTPc score, which is 19.68, confirming the collusive alliance.

However, the mean of mother' and father's global ratio is higher than 1 (mother's global ratio = 2.15; father's global ratio = 1.69) showing that parents perceive their family as oriented toward positive and functional aspects. This result is confirmed also by mothers' and fathers' score in communication, in which they refer good levels. The fact that parents perceive their family as

functional was described also by Visani et al. (2014), who stated that, when considering every member's point of view, there is a prevalence of positive ratio.

Nevertheless, in our opinion, parents' point of view could be an important starting point during the therapy, precisely because it corresponds little to clinical evaluation.

Furthermore, we found other important correlations. Our analysis underlined that rigidity perceived by mothers (assessed through FACES-IV) is negatively related to total organization at LTPc. Since rigidity in FACES-IV is referred to a system characterized by high discipline, defined roles and a familiar style with poor possibility of negotiation (Olson, 2000), high levels of rigidity are hypothesized to be related to difficulties in coping with life circumstances in family life and in outside environment (Laghi et al., 2017).

Furthermore, transitions between the four phases of LTPc are a model of ability to adapt to new circumstances; in fact, they involve the need to redraw the organization and the role of each participant (Castellina et al., 2006). This is in line also with a recent study, which shows that, in anorexic families, high rigidity is predictive for more serious psychopathology (Cerniglia et al., 2017).

As such, since participants of LTPc are asked to adapt continuously at new roles, we suppose that high levels of rigidity are related to low levels of organization and vice-versa.

Our findings are consistent also with the positive correlation found between fathers' balanced flexibility and LTPc total organization: in fact, this dimension is meant as the ability to adapt to different phases of life, to socio-cultural contexts and to both internal and external events of family life. It establishes the balance between organization and disorganization (Visani, 2014). In the light of the above, it is particularly noticeable that high levels of flexibility are related to a better organization at LTPc.

Moreover, recent studies underlined that families of anorexic patients are characterized by a poor organization at LTPc, because of the difficulty both of parental couple and of daughter in

maintaining their own role during all the phases: patients in particular would try to be included in the dyadic part between parents, in order to reduce the conflict between parental couple (Balottin et al., 2017). Our analysis is consistent with this observation: in fact, we found that mothers' enmeshment is negative related with both mothers' and daughter's organization at phase 4. This means that if mothers are enmeshed, they do not let daughters play alone or, at opposite site, they are not able to correct their daughters when they try to be included in the marital couple. This data was shown also by Balottin et al. (2018), who underlined that anorexic adolescents are not able to let the parents interact in the fourth phase, becoming involved in their relationship; in particular, they act as they should control the relationship between their parents.

Our analysis also shows a positive correlation between the parents' mean of percentile score in cohesion and total affective contact at LTPc: as the definition of cohesion points out, it shows the balance between sense of belonging and separation. This dimension embraces the way in which every member interacts with others in family's relationships (Visani, 2014). So, higher levels of cohesion relate to better balance in emotionality. This shows that if family members are cohesive each other, they can express better positive emotions. This is also confirmed by a recent study (Balottin et al., 2017) which underlines that the parental conflict often negatively impacts both on the parental and on the familiar affective warmth.

Implications

The first aim of this study was highlight the presence of a typical pattern of family functioning in AN and compare parents' perception through FACES-IV scales: consistent with the literature (Ciao et al., 2015; Laghi et al., 2017; Ma, 2011; Wallis et al., 2018), we found a general agreement between parents at FACES-IV subscales and we also recognized as typical pattern of family functioning, that parents describe as generally functional.

Nevertheless, using the LTPc we found that most of the families have "collusive alliance". It means that families show dysfunctional aspects and that they are characterized by an internal parental conflict, which is shifted on the daughter (Fivaz-Depeursinge & Corboz-Warnery, 1999). This is in line with recent studies (Balottin et al., 2017, 2018), which shown that daughters become frequently involved in parents' interaction during phase 4, in order to control their relationship and reduce the conflict between parental couple.

Comparing this data with results at FACES-IV we underlined that parents' perception should be considered less objective than the clinician's point of view. In this line, the LTPc becomes an essential instrument of the assessment of family dynamics in anorexic patients. However, our analysis showed that father's perception is more objective than mother's one and more like to the clinician's point of view. This is consistent with other studies, which show that fathers are more critical and less involved in their daughters' illness (Anastasiadou et al., 2014; Kyriacou et al., 2008; Whitney et al., 2012).

This study provides some limitations: first, the sample size, which can be extended to confirm these results on a wider population. Furthermore, we considered both outpatients and inpatients adolescents who had, for this reason, different grades of gravity and psychopathology. A second limitation is that we did not consider patients' point of view: this does not allow to have a complete overview of family perceptions. Finally, we only compare one self-reported evaluation method (FACES-IV) with a standardized clinical one (LTPc); as Holtom-Viesel and Allan suggest (2014), besides FACES-IV, other self-reported measures should be implemented in the evaluation of families' perception.

However, our study has the important strength to first evaluate the comparison between self-administered measures of family functioning and a standardized direct observation instrument, such as the LTPc. In fact, as far as we know, there are no other studies in literature that use and compare these two measures. Our study firstly suggests that FACES-IV cannot be considered as the

only family assessment measure for this type of patient. Self-report tools introduce clinicians to the represented family level, that is the frequently idealized perceptions of functioning, while direct observational instruments reveal the level of the practicing family, that is, the interactions in the here and now of the evaluation (Reiss, 1989). These two levels can show a discrepancy between the image that family wants to propose and the level of the interactions it expresses and may represent a relevant clinical issue for the patient.

So, our results suggest to using both self-report and observational instruments in family functioning assessment of AN patients. Self-report questionnaire should be considered as an important starting point during the treatment, to discuss with family member the possible discrepancy with observational instruments and to facilitate the understanding of the real difficulties which affect their family, in order to modify and improve their family functioning.

Declaration of conflicts of interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Table

Table 1

Parents' significant means and standard deviations in FACES-IV subscales.

FACES-IV Subscale	**Mother**		**Father**	
	N = 20		*N* = 20	
	M	***SD***	***M***	***SD***
Balanced Flexibility	53.83	19.72	54.95	18.67
Balanced Cohesion	57.8	22.37	61.55	22.51
Enmeshment	31.45	23.53	35.15	22.66
Disorganization	39.42	24.99	43.2	26.27
Disengagement	38.2	22.31	33.52	24.45
Communication	34.75	7.23	35.47	6.75
Flexibility Ratio	1.65	1.24	1.63	1.92

Family system approach to behavioral problems in anorexia nervosa: Exploring discordances between adolescent patients and parents

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ABSTRACT

The primary objective of this study was to investigate the discrepancies among the perception of behavioral problems self-reported by adolescent patients with eating disorders and rated by their mothers and fathers. Moreover, we explored factors associated with the observed disagreement among the family members. Forty-eight female adolescents and both their mothers and fathers took part in this study. Anamnestic and socio-demographic data were obtained through clinical interview. The patients' behavioral problems were assessed through well-validated questionnaires: the adolescents filled in the Youth Self-Report, whereas mothers and fathers separately completed the Child Behavior Check List. Internalizing behavior emerged as the most frequent problems reported by all the family members. Nonetheless, discrepancies emerged for specific subscales (i.e., somatic complaints, thought problems, and rule-breaking behaviors), for which patient-reported scores were significantly lower than parent-reported ones. Specific physical (i.e., menstrual cycle and weight), disease-related (i.e., purging behaviors, dysmorphophobia) and psychosocial (i.e., school failure) factors emerged as significant contributors to these discrepancies. The present study provides a detailed picture of discrepancies in specific behavioral problems' perception among adolescents with eating disorders, their mothers and fathers. The clinician's awareness of these discrepancies and of the factors contributing to them may inform clinical consultation and treatment.

KEYWORDS: anorexia nervosa; comorbidity; eating disorders; family; parents

1. Introduction

Adolescent patients with ED have a high rate of comorbid psychiatric symptoms, ranging from 45 to 97% of subjects with anorexia nervosa (AN) (Herpertz-Dahlmann, 2015). Previous studies highlighted that internalizing behavioral problems are among the most frequent comorbidities, including the presence of thought problems (Fennig et al., 2017; Muratori et al., 2004) and somatic complaints (Wentz et al., 2000) that may exacerbate the risk of depressive and anxiety disorders (Criscuolo et al., 2020; Stice et al., 2001; Zaider et al., 2000). Although these disorders have complex and heterogeneous etiology, family characteristics appear to play a key role in their onset and progression (Jewell, Blessitt, Stewart, Simic, & Eisler, 2016). More specifically, the presence of psychological and emotional conflicts between family members – usually between the parents and the patient – greatly contribute to the severity and chronicity of these conditions (Criscuolo et al., 2020). For example, discrepancies among the parents and the adolescent daughter for what pertains the perception of emotional and behavioral family functioning have previously documented in these families (Laghi et al., 2017).

When assessing the presence of behavioral problems in adolescents with psychiatric illness and psychopathology, multi-informant approaches should be considered as they can provide a multifaceted view of to help clinicians in decision-making and treatment planning (Comer & Kendall, 2004). There is a substantial amount of literature that provided multi-informant assessment of behavioral problems in healthy (Janssen et al., 2004; Van der Ende et al., 2012) and at-risk (Martin et al., 2004; Salbach-Andrae et al., 2008) adolescents. For instance, van der Ende and colleagues (Van der Ende et al., 2012) determined agreement among the reports of adolescent problem behavior by parents and adolescents themselves. Discrepancies emerged as adolescents reported higher levels of behavioral problems

compared to parental reports. These findings suggest that obtaining information from multiple informants should be key to obtain a complete view on adolescents' problem behaviors. Moreover, Martin and colleagues (Martin et al., 2004) examined clinically relevant patterns of agreement between parent and at-risk adolescents ratings of adolescent behavioral problems, by means of self-reported questionnaires. The overall agreement between parent-adolescent ratings was modest, further confirming the need of a multi-informant approach.

Obtaining independent information from adolescents with ED and their parents is warranted to highlight potential areas of interpersonal family conflicts that may dramatically affect the daily quality of life of the patients and their primary caregivers (Cerniglia et al., 2017). Salbach-Andre and colleagues (Salbach-Andrae et al., 2008) reported higher scores in parent-reported internalizing problems (e.g., somatic complaints) compared to scores obtained by their daughters. Although this study suggested the presence of discrepancies in the perception of behavioral problems between adolescents with ED and their parents, the authors did not assess separately the reports of mothers and fathers. Additionally, factors that may contribute to such discrepancies were not explored. Noteworthy, the study from Salbach-Andre and collaborators (Salbach-Andrae et al., 2008) has never replicated. As such, the presence of paternal and maternal discrepancies with respect to adolescents' ratings of their own behavioral problems, as well as the study of the role played by physical characteristics (e.g., weight and menarche), associated symptoms (e.g., restrictive or purging behavior) and psycho-social factors in these discrepancies remain mostly unexplored.

As such, the main goal of the current study is to assess from a triadic family-centered perspective the potential discrepancies in the perceptions of behavioral problems reported

by patients with ED, their mothers and their fathers. Moreover, a second exploratory goal was to investigate the relative role played by physical characteristics, ED-associated symptoms and psychosocial factors in contributing to triadic discrepancies in the perception of the young patients' behavioral problems.

2. Methods

2.1. Population

Forty-eight female adolescent patients diagnosed with restrictive ED were consecutively enrolled together with their mothers and fathers between May 2014 and January 2020 at the ****blind****. Inclusion criteria were: diagnosis of anorexia nervosa or other restrictive eating disorders according to Diagnostic Statistical Manual (DSM-5) and age between 11 and 18 years. Adolescents were excluded from the study if they presented at least one of the following criteria: mental retardation, diagnosis of psychotic disorders prior to the enrolment, neurological pathologies, brain injuries or other medical conditions associated with psychiatric symptoms. The same exclusion criteria applied also to parents. All the enrolled patients and their parents provided written informed consent to participate in the study. The study received the approval of the Ethics Committee of the ****blind****. All the procedures are consistent with the principles of the World Medical Association Declaration of Helsinki.

2.2. Procedures

The access of the patients to the hospital unit could be for hospitalization, day hospital and/or outpatient visit. After providing written informed consent, the patients were interviewed by a trained child neuropsychiatrist to collect clinical and socio-demographic data. In order to measure perceptions of behavioral problems in the family members, adolescent patients were asked to fill in the self-report Youth Self-Report (YSR) (Achenbach, 1991a), whereas

mothers and fathers were asked to fill separately the Child Behavior Check-List (CBCL-6/18) (Achenbach, 1991b).

2.3. Measures

Subjects were interviewed for socio-demographic characteristics (i.e., patients' age; maternal and paternal educational level; marital status) and physical variables (i.e., weight, kg; height, m; BMI, kg/m^2; weight loss, kg; menarche; irregular period, including both primary or secondary amenorrhea). Additionally, trained child neuropsychiatrists collected information to detail eating disorder features (i.e., purging behavior, binge eating, dysmorphophobia, obsessive-compulsive acts, and hyperactive attitude) and psychosocial problems (i.e., risky behaviors, social inhibition, and school retreat).

The YSR and the CBCL-6/18 are the most widely used instruments to measure behavioral problems in children and adolescents. These scales have excellent psychometric properties and comprehensive reliability and validity evidence are available. Each item is rated on a Likert scale as follows: 0 (not true), 1 (somewhat or sometimes true), or 2 (very true or often true). For both tools, eight subscales describe specific behavioral problems (see Table 1) and are resumed into three domains: internalizing (INT), externalizing (EXT) and total (TOT) behavioral problems. The continuous T scores can be categorized as clinical risk (above 64 for domains and above 70 for subscale), borderline risk (between 60 and 64 for domains and between 65 and 70 for subscales) and no risk (below 60 for domains and below 65 for subscale). In the present report, the scores obtained from patients' YSR are indicated as P-YSR, whereas mothers and fathers' reports are indicated respectively as M-CBCL and F-CBCL.

Table 1. Description of the YSR and CBCL subscales.

YSR/CBCL subscales	Acronym	N° Items	Description
Anxious/depressed	A/D	13	Feelings of being guilty, nervous, unloved, worthless; it comprises suicidal thoughts
Withdrawal	WD	8	Feelings of being shy, lacking energy, sad, withdrawn
Somatic complaints	SC	11	Feelings of being constipated, dizzy, tired; it comprises aches, headaches, nausea, vomits, stomach-aches, eye, and skin problems
Social problems	SP	11	Feelings of being lonely, dependent, not getting along, jealous, teased, not liked, clumsy
Thought problems	TP	15	It comprises hallucinations, delusions, repetitive behaviour or strange behaviour, feelings of mind off, sleep problems.
Attention problems	AP	10	It comprises troubles in concentrating and paying attention, filing to finish, being impulsive and daydreaming, confused
Rule-breaking behaviors	RB	17	It comprises drug and alcohol abuse, rule-breaking, lies and cheats, lacking guilt, having bad friends, running away, setting fires, stealing, vandalism
Aggressive behaviors	AB	18	It comprises disobeying, verbal, and somatic fighting, arguing, being suspicious, mean, stubborn, mood changing

2.4. Data analysis

Among the 48 families that were enrolled in this study, six (13%) provided incomplete CBCL and/or YSR questionnaires. According to a conservative approach, subjects with incomplete data were removed from the analyses. As such, the final sample available for statistical analysis consisted in 42 parent-child triads. Three separate univariate analyses of variance (ANOVAs) were used to assess the presence of significant differences among P-YSR, M-CBCL and F-CBCL scores for the three core behavioral problems domains (i.e., INT, EXT, TOT). Moreover, to investigate the presence of statistically significant discrepancies among mothers, fathers and patients' perceptions of specific behavioral problems separated ANOVAs were implemented to compare the P-YSR, M-CBCL and F-CBCL scores for the eight subscales (i.e., A/D, WD, SC, SP, TP, AP, RB, and AB). The significant differences

among family members have been further explored for associations with socio-demographic and physical variables, eating disorder features, and psychosocial problems by means of mean-comparisons and correlational analyses. To adjust for multiple-comparison bias, the Benjamini-Hochberg test was used, setting $p < .05$ and $q < .10$. Effect size was computed by means of Cohen's d coefficient for *t*-tests, by means of Pearson's *r* coefficient for correlations and η^2_p for ANOVAs. All the analyses were carried using IBM SPSS 25 for Windows, setting $p < .05$.

3. Results

3.1. Sample characteristics

Descriptive statistics are reported in Table 2. There were no significant differences between included and excluded subjects based on the completion of CBCL and/or YSR questionnaires. Figure 1 reports the P-YSR, M-CBCL, and F-CBCL for the present sample.

Table 2. Descriptive statistics.

		Whole sample (n = 48)		Complete data (n = 42)	
Patients' data		Mean	SD	Mean	SD
Age, years		14.96	1.80	15.12	1.76
Weight, kg		40.14	6.70	40.71	7.27
BMI, kg/m^2		16.00	2.39	16.10	2.52
Weight loss, kg		15.48	11.13	16.09	11.47
		N	%	N	%
Menarche	yes	39	81.3	34	81.0
	no	9	18.8	8	19.0
Irregular period	yes	41	85.4	36	85.7
	no	7	14.6	6	14.3
Social inhibition	yes	27	56.3	23	54.8
	no	21	43.8	19	45.2
School retreat	yes	8	16.7	8	19.0
	no	40	83.3	34	81.0
Risky behaviours	yes	10	20.8	9	21.4

	no	38	79.2	33	78.6
Purging behaviour	yes	11	22.9	10	23.8
	no	37	77.1	32	76.2
Binge eating	yes	13	27.1	12	28.6
	no	35	72.9	30	71.4
Dysmorphophobia	yes	41	85.4	35	83.3
	no	7	14.6	7	16.7
Obsessive-compulsive acts	yes	19	39.6	17	40.5
	no	29	60.4	25	59.5
Hyperactive attitude	yes	29	60.4	23	54.8
	no	19	39.6	19	45.2

Parents' data		N	%	N	%
Maternal educational level	low	6	12.5	5	11.9
	middle	30	62.5	26	61.9
	high	12	25.0	11	26.2
Paternal educational level	low	12	25.0	12	28.6
	middle	28	58.3	23	54.8
	high	8	16.7	7	16.7
Married/cohabitant	yes	36	75.0	32	76.2
	no	12	25.0	10	23.8
Familiarity for eating disorders	yes	9	18.8	7	16.7
	no	39	81.3	35	83.3

Insert Figure 1 here

3.2. Comparing parental and patients' reports of behavioral problems

No significant differences emerged when comparing together P-YSR, M-CBCL, and F-CBCL for INT, EXT and TOT core domains. Nonetheless, differences between P-YSR and M-CBCL for INT, $t(41) = 1.95$, $p = .058$, EXT, $t(41) = 1.92$, $p = .062$, and TOT, $t(41) = 1.99$, $p = .054$ only approached statistical significance, with small effect sizes (Cohen's *d* range [01,.26]). For all the three core domains, mothers tended to reported higher rates of behavioral problems in comparison to self-reported scores of patients. No significant effects emerged for father-patient and father-mother comparisons.

Statistically significant differences emerged among P-YSR, M-CBCL, and F-CBCL for specific subscales: SC, $F(2,82) = 10.68$, $p < .001$, $\eta^2_p = .21$, TP, $F(2,82) = 7.08$, $p < .001$,

η^2_p = .15, and RB, $F(2,82) = 6.27$, p = .003, η^2_p = .13. For all these three subscales, post-hoc comparisons revealed that patient-reported scores were significantly lower compared to mother-reported ones ($3.75 < t\text{s} < 5.08$, $p\text{s} < .001$) with low to high effect size estimates (Cohen's d range [.34,.85]) as well as to father-reported ones ($2.65 < t\text{s} < 3.25$, $p\text{s} \leq .01$) with low to moderate effect size estimates (Cohen's d range [.37;.50]). Multiple comparison check confirmed all significant effects.

3.3. Exploring contributors to parental and patients' perception of behavioral problems

A schematic overview of the associations of eating disorders features and psychosocial problems with P-YSR, M-CBCL, and F-CBCL scores is reported in Figure 2. Significant associations are discussed in the following paragraphs.

Insert Figure 2 here

3.3.1. *Socio-demographic and physical variables*

Patients' weight significantly correlated with M-CBCL and F-CBCL scores in the RB subscale, respectively r = .59, $p < .001$ and r = .38, p = .025, but not with P-YSR score (Figure 3). The presence of menarche was significantly associated with higher P-YSR SC scores, $t(40) = 2.18$, p =.039, but not with the perceptions of mothers and fathers. By converse, irregular period was significantly associated with higher M-CBCL SC, $t(40) = -2.49$, p = .035, but with P-YSR and F-CBCL SC scores. No effects emerged for socio-demographic variables, BMI and weight loss. All associations survived Benjamini-Hochberg multiple comparison bias check.

Insert Figure 3 here

3.3.2. Eating disorders features

Descriptive statistics for CBCL and YSR scores split by eating disorders features are reported in Supplementary Table S1. Purging behavior emerged as differentially associated with TP and RB scores reported by patients, mothers and fathers. Specifically, the presence of purging behavior was significantly associated with higher TP scores in patients, $t(40) = 2.81$, $p = .008$, $d = .86$, and fathers, $t(40) = 2.45$, $p = .019$, $d = .91$, but not in mothers. Moreover, the presence of purging behavior was significantly associated with higher RB scores in mothers, $t(40) = 2.47$, $p = .018$, d = .84, and fathers, $t(40) = 2.14$, $p = .038$, $d = .75$, but not in patients. The presence of dysmorphophobia significantly associated with higher scores in TP only in fathers, $t(40) = 3.16$, $p = .003$, $d = 1.18$, and it was significantly associated with higher scores in SC only in patients, $t(40) = 2.70$, $p = .020$, $d = .91$. Binge eating, obsessive-compulsive acts and hyperactive attitude did not emerged as significantly associated with differential perception of the patients' behavioral problems among the three family members. All comparisons survived Benjamini-Hochberg check for multiple comparison bias.

3.3.3. *Psychosocial problems*

School problems emerged as differentially associated with TP and RB scores reported by patients, mothers and fathers. Specifically, the presence of school problems significantly associated with higher scores in TP in patients, $t(40) = 2.18$, $p = .036$, $d = .78$, and fathers, $t(40) = 2.23$, $p = .031$, d .92, but not in mothers. Moreover, the presence of school problems significantly associated with higher RB scores in mothers, $t(40) = 2.32$, $p = .026$, $d = .81$, and fathers, $t(40) = 2.70$, $p = .010$, d .92, but not in patients. No differential effects emerged for risky behaviors and peer-relationship issues. All comparisons survived Benjamini-Hochberg multiple comparison bias check.

4. Discussion

4.1. Discrepancies in behavioral problems ratings among family members

No significant differences emerged between mothers and fathers for internalizing, externalizing and total behavioral problem scores. Additionally, when comparing parental CBCL scores and the patients' YSR ones, a trend to significance only emerged for the comparison between mothers and patients' scores for internalizing and externalizing behavioral problems. This trend suggests that specific problematic behaviors, rather than the overall amount of behavioral problems, may result in different perceptions of relational and psychological difficulties among family members. Indeed, significant triadic differences emerged for specific behavioral problems (i.e., somatic complaints, thought problems and rule-breaking behaviors).

First, patients reported lower scores for the somatic complaints subscale compared to both parents. Previous literature suggests that patients with ED may deny or even lack an integrated perception of bodily painful sensations and suffering and this may be especially true in the initial phase of the disorder (Ekeroth et al., 2003; Salbach-Andrae et al., 2008; Viglione et al., 2006). Additionally, contrary to their parents' perception, it has been suggested that adolescents with ED may consider specific psychosomatic symptoms as essentially ego-syntonic (Gregertsen et al., 2017), thus reducing the possibility that they report them as a problematic feature having a negative impact on their daily quality of life.

Patients also reported lower scores for thought problems compared to their parents. The CBCL/YSR items included in thought problems subscale refer to issues related to the disturbed thought and bizarre or obsessive behaviors. We assume that patients may struggle to recognize some core aspects of ED related to thought disturbances (e.g., dysmorphophobia or bluntly obsessive food patterns) whereas their parents, as external observers, may recognize them more easily as pathological symptoms (Becker et al., 2004;

Berg-Nielsen et al., 2003). As previously reported (Whitney et al., 2005), parents may perceive ED core aspects such as dysmorphophobia or obsessive conducts as maladaptive pathological symptoms, and it may be dramatically difficult for them to obtain a deeper meaning-making about these symptoms and their value for their daughters.

Finally, patients reported lower scores in rule-breaking behaviors compared to their parents' ratings. Qualitative studies suggested that parents feel their daughter becoming more dependent and demanding and that the illness contributed to relational conflicts and arguments within the family, contributing to the emergence of a stressful climax within the household (Whitney et al., 2005). The items in the rule-breaking behaviors subscale describe behaviors such as disrupting daily family rules (e.g., the rule of eating together) and addiction-like behaviors (e.g., the compulsive nature of restrictive conducts). While adolescents with ED may perceive these pathological behaviors as normal habits needed to control caloric intake and body shape, the parents may have a different view based on their educational perspective and rule-setting role.

4.2. Factors associated with discrepancies in behavioral problems ratings

Among physical characteristics, the presence of menarche and the menstrual cycle were associated with significant differences between somatic complaints scores reported by on patients and their mothers. In other words, the adolescents with irregular menstrual cycle (e.g., primary or secondary amenorrhea) reported lower scores in this subscale, whereas this was not true for their mothers, which reported higher scores for the same subscale. It can be hypothesized that, from the mother's point of view, the presence of the menstrual cycle conveys a sense of normal growth, consequently perceived as more developmentally mature and feminine (Usmiani & Daniluk, 1997). On the contrary, the presence of the menstrual cycle may be lived as a painful experience by the patients themselves, probably

because of a challenging integration of the emerging changes in their body with the emerging somatic and psychological identity (Jappe & Gardner, 2009). As such, our results indirectly corroborate the evidence of a complex relationship between physical maturation and mother/daughter dynamics in contributing to the development of a positive body image for adolescents girls (Boehm et al., 2016; Usmiani & Daniluk, 1997). From this perspective, not only the presence of irregular or absent menstrual cycle should be a focus of psychological consultation, but the exploration of meanings associated with the emergence of regular and physiological changes in the body of the young daughter should be explored within the family context, at least in the initial phases of the disorder.

Parents of girls with greater weight reported higher scores for rule-breaking behaviors. A potential explanation may be related to the fact that, as the patients gain weight, the themes around which family members live emotional conflicts may move from the adequacy of weight (Shrewsbury et al., 2010) to other topics, such as the impact of rule-breaking behaviors in daily family life. Research conducted on the process of family therapeutic interventions with these patients may further contribute to understand how changes in weight in these patients may affect the emergence of discrepancies in the perception of the patients' provocative and oppositional behaviors among the family members (Mensi et al., 2020).

The presence of purging behaviors (e.g., self-induced vomiting, use of laxatives, diuretics or diet pills) was also linked with higher parent-reported rule-breaking behaviors scores, but not with patient scores for the same subscale. These findings may suggest that adolescents with ED do not recognize purging behaviors as rule-breaking. According to previous qualitative studies, they may rather perceive these compulsive behaviors as attempts to cope and dampen the negative emotions elicited by food and eating (McNamara et al.,

2008). Notably, the scores reported by fathers and daughters in the thought problems subscale were higher in presence of purging behaviors. Similarly, the presence of dysmorphophobia significantly associated with heightened scores of thought problems in the fathers' CBCL. Taken together, these findings appear to suggest that fathers may play a critical – yet underestimated – role in the healthcare journey of patients with ED (Balottin, Mannarini, Mensi, et al., 2017). Fathers may need specific supportive interventions and guidance to fully understand the relevance of restrictive conducts and body image for their daughters psychological well-being (Whitney et al., 2005).

Among psychosocial factors, school failure was significantly associated with greater thought problems scores reported by patients and their fathers. Moreover, it was also linked to greater differences between the scores for rule-breaking behavioral problems reported by the patients' and both their parents. On the one hand, this further confirms that father may be an underestimated ally for patients in family therapies, as his active engagement may promote overall family members' awareness of the emotional world of the patient (e.g., by considering potential school problems and breakdown as by-product of psychological sufferance and thought disturbances (Stice et al., 2001). On the other hand, clinical practice suggests that mothers of adolescents with ED may highly invest in the academic and performance-related success of their daughters, so that school failure may be perceived by them as an aggressive and provocative act that violates the rule of adherence to maternal expectations (Campos et al., 2012).

4.3. Study limitations

A major limitation of this study is represented by the relative small sample size, conditioned by the need to include only triads that fully provided the questionnaires required by the study. Although the Cohen's *d* effect size coefficients for the association analyses were all in a

range from medium to high, this is a factor that may limit our ability to generalize about the results and underline the need to extend the sample size in order to confirm these results on a wider population. Secondly, documenting the presence of discrepancies is not sufficient nor equal to identify which of the family member provides the “true” perception about behavioral problems. Nonetheless, the emergent themes and variables associated with such disagreements may serve as potential pathways to promote effective dialogic exchange within the family during therapeutic consultations. Third, we focused on restrictive eating disorders and anorexia nervosa leaving out other clinical forms such as bulimia nervosa e binge-eating disorders. Future studies may investigate whether or not these discrepancies are common to all ED.

4.4. Conclusions

The results of our study suggest only a partial agreement between the members of the triad for what regards the perception of behavioral problems in adolescents diagnosed with anorexia nervosa. The implication of these findings is noteworthy. From a clinical point of view, the awareness of the factors involved in the discrepant perception of behavioral problems by different family members may help clinicians in taking care of the patient and the entire family (Mensi et al., 2020). A family system approach to the assessment of behavioral problems in adolescents with anorexia nervosa is highly suggested and it is consistent with the need of promoting family-centered support to these patients.

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Authors' contributions: MM designed the study, CR collected data, LP conducted statistical analyses, RB provided scientific supervision. All authors contributed to the drafting of the manuscript and agreed on the final version to be submitted for publication.

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FIGURE LEGEND

Figure 1. P-YSR, M-CBCL and F-CBCL behavioral problems scores for (A) core dimensions and (B) subscales.

Note. P-YSR, Patients' Youth Self-Report; M-CBCL, Mother-reported Child Behavior Check List; F-CBCL, Father-reported Child Behavior Check List; INT, Internalizing problems; EXT, Externalizing problems; TOT, Total problems; A/D, Anxious/depressed; WD, Withdrawal; SC, Somatic complaints; SP, Social problems; TP, Thought problems; AP, Attention problems; RB, Rule-breaking behaviors; AB, Aggressive behaviors. Bars represent standard errors. In the background: white represents absence of behavioral problems; light grey represents risk of behavioral problems; dark grey represents presence of behavioral problems.

Figure 2. Schematic overview of the differential associations of physical variables, eating disorder behavioral symptoms and psycho-social problems with patients (P-YSR), mothers (M-CBCL) and fathers (F-CBCL) scores of subscales Somatic complaints (SC), Thought problems (TP), and Rule-breaking Behaviors (RB).

Note. Green down-faced arrow, statistically significant negative effect; Green up-faced arrow, statistically significant positive effect; Red cross, statistically non-significant effect.

Figure 3. Linear association between patients' weight and the Rule-breaking behavior (RB) score in the perception of (A) patients, (B) mothers, and (C) fathers.

Letters

COMMENT & RESPONSE

Prioritizing Family-Centered Mental Health Care for Pediatric Patients With Eating Disorders

To the Editor The Biel et al article[1] published in *JAMA Pediatrics* adds to the growing literature suggesting that a family-centered approach is necessary to address pediatric mental health care. We wholeheartedly agree with the authors about the urgent need to implement family-based models in pediatric psychiatry by focusing on parenting skills and family conflict as integrant part of comprehensive treatment plans for children mental health.[1]

Children and adolescents with eating disorders are among the patients who would greatly benefit from family-centered psychiatric care. Indeed, it is widely acknowledged that psychological and familiar factors are involved in the onset and progression of eating disorders as well as in effective therapeutic journeys.[2] Dysfunctional family relationships may potentially worsen the outcome of eating disorders and contribute to chronicization.[3]

As such, in line with the most recent guidelines, we believe that a family-centered approach should not be ancillary but rather a core element of both assessment and psychiatric care for pediatric patients with eating disorders. On the one hand, a multi-informant approach to the assessment is necessary to provide a richer and multifaceted view of the patient functioning, the family meaning-making processes about the disease, and the quality of the patient's relationships. By engaging both parents in patients' psychiatric consultation, clinicians can gather a more complete view of the psychopathologic symptoms and potentially highlight critical areas of interpersonal family conflicts that may negatively affect daily life.[4] On the other hand, by inviting the entire family to pediatric psychiatry consultations, the clinician may have a privileged view of the family functioning. As we previously reported,[5] the use of validated observational procedures to observe family triadic interactions (eg, the clinical version of the Lausanne Trilogue Play) may be highly beneficial to highlight potential dysfunctional dynamics that may inform and improve the therapeutic process.

In conclusion, we would like to follow up on the article from Biel et al[1] by calling researchers and clinicians to focus on family-centered approaches to assessment and psychiatric care of pediatric eating disorders. Family engagement should be regarded as a criterion standard in pediatric mental health care, and this is especially true for patients with eating disorders.

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Focus on family functioning in anorexia nervosa: new perspectives using the Lausanne Trilogue Play

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ABSTRACT

31 families of female adolescents affected by anorexia nervosa (AN) and 20 of girls with emotional and behavioral disorders participated in a semi-standardized videotaped game: the Lausanne Trilogue Play (LTPc). We aimed to clarify if there is a typical AN family profile and if the LTPc procedure could predict the risk of developing AN. We confirmed that AN families exhibit dysfunctional alliances. Particularly because of the difficulty of the three members to be available to the interaction at least with their body (participation) and to comply with the role expected at each stage of the game (organization). Moreover, these families show a significant worse functioning, especially regards to the mother-daughter phase of the game, in focal attention and affective contact functional levels, while in triadic and couple phases they present lower scores than comparison group in all functional levels. Furthermore, we found that LTPc may predict the possibility of belonging to a family with a daughter with AN rather than one whose daughter has a different disorder. Therefore, LTPc would allow clinicians foresee the risk of developing AN and tailoring the most suitable therapeutic intervention and finally see its effectiveness using LTPc for later follow-up video feedback sessions.

1. Introduction

1.1. Anorexia nervosa and family dynamics

Eating disorders (EDs) are a heterogeneous group of potentially severe pathological conditions, associated with moderate to high levels of psychosocial and work impairment (Hay et al, 2017).

Although they are among the most common chronic mental illnesses in adulthood, EDs have shown over the last years increased incidence among young people, especially in the high risk-group of 15–19 year old girls (Smink et al, 2012). Particularly considering Anorexia Nervosa (AN), a recent systematic review reported weighted population means (and ranges) of lifetime prevalence as 1.4% (0.1–3.6%) for women and 0.2% (0–0.3%) for men (Galmiche et al, 2019). Partial syndromes and subclinical anorexia nervosa are instead much more frequent, suggesting a prevalence between 2,4 and 4,3% (Jagielska & Kacperska, 2017). What is more, studies suggest a community wide increase in AN over the time, especially in women and young people (Keski-Rahkonen & Mustelin, 2016; Hoek, 2016).

The current scientific view about the etiology of EDs is multifactorial: the development of these pathologies depends on the presence of an individual vulnerability, mainly expressed during adolescence, combined with specific biological, psychological, environmental, family, socio-cultural risk factors (National Institute for Health and Clinical Excellence, 2004; Gutiérrez et al., 2015; Lock et al., 2015; Dell'Osso et al., 2016). The massive extent of these disturbs on the health status of individuals has ensured that the World Health Organization includes EDs among the priority mental illnesses of children and adolescents, highlighting the importance of an early therapeutic intervention (Treasure et al., 2010). Particularly, they are associated with a high rate mortality, up to 9.4% after more than 10 years of follow-up (1.8% in adolescents) (Steinhausen, 2002), with a fifth of them being suicidal deaths (Arcelus et al., 2011).

The International Statistical Classification of Diseases and Related

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Health Problems (ICD-10) defines AN as a disease characterized by deliberate weight loss, induced and sustained by the patient. The disorder is associated with a specific psychopathology whereby a dread of fatness and flabbiness of body contour persists as an intrusive overvalued idea, and the patients impose a low weight threshold on themselves.

Some evidences show that, compared to families without any eating disorder, AN ones have more dysfunctional family relations (McDermott et al., 2002; Gillet et al., 2009; Sim et al., 2009; Holtom-Viesel and Allan, 2014). Furthermore, adolescent girls with AN perceive their family functioning as worse and are less satisfied with their families than a control group. AN girls see their family interactions as difficult and characterized by less emotional closeness to the experiences, activities and interests of other family members (Laghi et al., 2017).

Parents of AN adolescents also undergo greater family conflict and experience more stress and depression (Sim et al., 2009). Those findings suggest that family dynamics can have a role in the onset and in the development of the disease (Rodríguez Martín et al., 2004; Ravi et al., 2009; Lyke and Matsen, 2013). On the other hand, these dynamics could also become the starting point for effective therapeutic strategies (Lyke and Matsen, 2013; Anastasiadou et al., 2014; Lock et al., 2015). Consequently, the focus of interest has shifted from the causal and etiopathogenetic role of the family, to a factor relevant in the maintenance of the disease over time (Holtom-Viesel and Allan, 2014); nowadays, parents are considered as an important resource in the treatment of EDs (le Grange et al., 2010).

Most researches about triadic interactions in families of patients affected by AN use self-reported information and non-standardized clinical assessments. Therefore, the current study aims to deepen the knowledge on AN family dynamics using a rigorous semi-standardized tool, the Lausanne Trilogue Play (LTP) (Fivaz-Depeursinge and Corboz-Warnery, 1999) in its clinical version (LTPc) (Malagoli Togliatti and Mazzoni, 2006). The basic rationale is that the quality of family functioning expressed during the LTPc session may be considered as an index of the family everyday real-life functioning. Previous findings (Balottin et al., 2017; Balottin et al., 2018) showed the ability of LTPc procedure of identifying dysfunctional dynamics in AN families compared to other ones. In particular, families of adolescents with AN show dysfunctional alliances more frequently than comparison families. However, little is yet know about the specific functional family profiles of the AN families in the different relational configuration, corresponding to the LTPc phases (i.e. mother-daughter, father-daughter, three together, parents). Further studies are therefore needed to understand if specific family characteristics can discriminate between families with a daughter with AN and those with daughters with other psychopathologies.

1.2. Aim and hypothesis

Comparing adolescent patients with AN with patients suffering from other psychiatric disorders, the present study aimed to:

- explore the presence of dysfunctional dynamics in AN families compared with families with daughters affected by different disorders, in order to confirm or not previous findings obtained using the Lausanne Trilogue Play (LTP);
- investigate whether the overall functionality or dysfunctionality of the families depends more on participation, organization, focal attention or affective contact, i.e. whether one of the total functional levels exhibit a greater influence on the type of alliance (global score);
- applying the same approach regarding the four phases (mother-daughter dyad, father-daughter dyad, triad and parental couple), questioning if one or more phases mainly influence the general LTP family scores.
- evaluate if the LTP procedure could predict the risk of developing AN, compared to other psychiatric disorders

2. Methods

2.1. Participants

Child and adolescent neuropsychiatrists and clinical psychologists recruited 31 families of patients affected by AN and 20 families of patients with emotional and behavioral disorders of childhood and adolescence, according to ICD-10 criteria (World Health Organization, 1992), referred to Child Neuropsychiatry Unit.

We included only female patients diagnosed with anorexia nervosa (ICD-10), aged between 13 and 18 years and with a current BMI below the tenth percentile per age and sex. Clinicians supported the diagnoses of AN and potential comorbid disorders by the K-SADS-PL semi-structured interview (Kaufman et al., 2000). In this study, we did not enlist male patients, adolescents affected by autism spectrum disorder, schizophrenia or learning disabilities (ICD-10) or patients that have received psychotherapy for more than three months. We also excluded single-parent families and participants with insufficient understanding of the Italian language.

The mean age of the patients with AN was 16.16 years (10° percentiles = 13 and 90° = 18 years) and their mean current BMI was 16.23 (range = 13-19). For what concerns parents, the mothers' mean age was 52 years (10° = 40.2 and 90° = 59.4 years) while the fathers' one was 50 years (10° p = 39.4 and 90° = 55.6 years). The mean of the socioeconomic status (SES) (Hollingshead, 1975) was 47 (10° p = 16 and 90° = 60).

At the same time, 20 families in which an adolescent was diagnosed with emotional and behavioral disorders of adolescence took part in the study as a clinical comparison group. We recruited only normal weight female adolescents (13-18 years old) diagnosed with emotional and behavioral disorders of childhood and adolescence according to ICD-10. We applied to this clinical comparison group the same exclusion criteria used for the case sample, adding the presence of symptoms related to food (either restrictive or purging or binge eating conducts). The mean age of the participants was 16 years (10° p = 14 and 90° =18 years). As to parents, the mothers' mean age was 48.31 years (SD: 7.31; range 38-59) while the fathers' one was 52 years (SD: 7.74; range 39-63); the mean SES was 34 (10° p = 17 and 90° = 62).

2.2. Procedure

Clinicians described the study to the participants, including information about rights and privacy protection. We performed the study in accordance with the code of good ethical practice and the ethical standards laid down in The Declaration of Helsinki and its later amendments. We collected data within a project authorized in 2017 by the Ethical Committee of IRCCS Policlinico San Matteo in Pavia. All families gave their written informed consent and were free to retreat in any moment. All data has been anonymized.

A member of the neuropsychiatric team evaluated all patients and collected a comprehensive medical and family history, besides submitting structured tests in order to confirm the diagnosis and investigate the presence of potential comorbid disorders through K-SADS-PL (Kaufman et al., 2000) and Eating Disorder Inventory (EDI-3) (Garner, 2004). All families participated in a videotaped play session by means of a video camera put on a movable tripod (upon written videotaping agreement) according to the clinical version of the LTP procedure. Two specifically trained judges, blind to the results of the other evaluations, scored it. In rare cases of disagreement in attributing the score, they reached an agreement through discussion.

2.3. The Lausanne Trilogue Play - clinical version (LTPc)

LTPc (Malagoli Togliatti and Mazzoni, 2006; Lavadera et al., 2011) is a direct observational tool of families' triadic interactions based on a structured task: parents and daughter take part in a game session with precise rules, trying to play altogether as a team and have fun. Unlike Lausanne Trilogue Play (Fivaz-Depeursinge and Corboz-Warnery, 1999), the LTP clinical version is a macro analytic observational measure. The aim of the procedure is to evaluate the quality of the triangular coordination shown by members during the triadic interaction and to characterize the type of family alliance. The alliances (collaborative, in tension, collusive, disturbed) express the quality of coordination that the family defines while sharing the game experience, trying to reach a common goal and could be functional or not. Expert judges videotape the game session and codify it according to a functional and clinical interpretation and to a structural one.

The first interpretation consists of a narrative game report that includes the description of setting, interaction, dialogues, non-verbal behaviors, affective contact, interactive mistakes and their compensation, duration and transitions during the game. On the other hand, the structural interpretation considers a coding scheme that comprises four scales, each defining an observational variable measured for each individual and for each phase and graded on a 3-point Likert scale from dysfunctional to functional. The two judges are required to define the presence – based on the frequency and duration – or the absence of some behavioral indicators in order to assign a score to each functional level:

- participation (inclusion/exclusion)
- organization (role respect)
- focal attention (shared attention)
- affective contact (maintenance of emotional contact)

Researcher asks parents to imagine organizing an activity with their daughter in four phases.

In the first phase, one parent interacts with the daughter, while the other one is simply present. In the second phase, the second parent interacts with the daughter, while the parent who played first is no longer involved. In the third phase, family must interact together as a triad. In the fourth phase, parents continue to interact and converse with each other, without involving the daughter. The whole play section takes approximately 15 min.

3. Results

We analyzed our data by means of software R version 3.5.1 (R Development Core Team, 2008). For what concerns the case-control comparison related to LTPc scores, we verified with the Kolmogorov Smirnov test that the main variables were not normally distributed. Therefore, we applied a comparison for independent samples by means of a non-parametric test (Mann Whitney U Test) in order to evaluate the presence of statistically significant differences (aim 1). To compare the influence of the four components (aim 2) and phases (aim 3) on the total score considering each group separately we used the non-parametric Wilcoxon Rank Sum test, designed to deal with dependent samples by comparing central tendencies of the samples. Bonferroni adjustment is employed for this multiple comparison. Statistical significance was attributed in case of $p < 0.05$. In the light of the absence of a normal distribution of the main variables, we evaluated the correlations through Spearman Rho coefficient, with statistical significance of two-tailed p-value < 0.05.

Moreover, a logistic regression was applied, considering the group membership as target variable. The multivariate analysis identifies which variables influence more the group membership (aim 4).

Table 1
Differences between AN families and emotional and behavioral disorders of adolescence ones relatively to family LTPc total parameters.

LTPc parameter	Group	*Mean*	*SD*	*p-value*
Total general LTPc				
Participation	AN	6.355	1.427	$3.869*10^{-5}$
	Comparison	7.850	0.366	
Organization	AN	3.516	1.207	$7.733*10^{-6}$
	Comparison	5.400	1.535	
Focal attention	AN	3.741	1.413	0.0001
	Comparison	5.400	1.465	
Affective contact	AN	3.355	1.199	0.0003
	Comparison	4.400	0.883	
Family total score	AN	21.613	4.709	$6.877*10^{-6}$
	Comparison	29.050	4.684	

Statistical significance was attributed in case of $p < 0.05$

3.1. Family dynamics in AN families and comparison families

3.1.1. Families' alliance categories

None of the families of adolescents affected by AN exhibited collaborative alliances and only 32% of them presented in tension alliances. They mostly showed collusive (50%) and disturbed (18%) alliances, while families of patients with emotional and behavioral disorders bared only collaborative (35%) and in tension (65%) ones.

3.1.2. Comparison between the two groups

Comparing LTPc scores between AN families and comparison ones, we found that these last would globally have a better functioning in all the investigated indicators (Table 1).

3.2. The influence of the functional levels on total scores and families' profiles

We confirmed that AN families exhibit worse scores in all parameters than the comparison group, but we carried out more accurate statistical analysis to find out which of the four functional levels mainly influenced the general LTPc total score in both groups, considering the ratio between each specific score and the total one. Focal Attention (Chi-squared = 2.694; $p = 0.101$) and Affective contact (Chi-squared = 0.675; $p = 0.411$) did not significantly influence the total LTPc scores in both groups, but participation (Chi-squared = 4.807; $p = 0.028$) and organization (Chi-squared = 4.639; $p = 0.031$) in AN families influenced the total LTPc scores more than in the parallel clinical group.

Furthermore, we compared the influence of the four components on the total score considering each group separately and, as shown in table 2, we discovered that families whose member was affected by emotional and behavioral disorders of adolescence show a more disharmonious profile, with worse scores in the affective contact level, while the AN group performs much more harmonic scores. We also

Table 2
Influence of the four components on the total score in each group.

AN families	Participation	Organization	Focal attention
Organization	$4.7*10^{-9}$		
Focal attention	$7.5*10^{-9}$	0.47	
Affective contact	$4.7*10^{-9}$	0.84	0.47
Emotional and behavioral disorders of adolescence			
	Participation	Organization	Focal attention
Organization	$6.6*10^{-7}$		
Focal attention	$6.6*10^{-7}$	0.93506	
Affective contact	$63.9*10^{-7}$	0.00074	0.00074

Statistical significance was attributed in case of $p < 0.05$

Table 3
Differences between the two groups referring to LTPc parameters in each phase.

LTP phases and levels		*Mean*	*SD*	*p-value*
LTPc phase 1: Mother + Daughter – Father				
Participation	AN	1.677	0.475	0.070
	Comparison	1.900	0.308	
Organization	AN	1.065	0.442	0.080
	Comparison	1.300	0.470	
Focal attention	AN	1.129	0.428	0.009**
	Comparison	1.500	0.513	
Affective contact	AN	0.839	0.374	0.030**
	Comparison	1.050	0.224	
LTPc phase 2: Father + Daughter – Mother				
Participation	AN	1.774	0.425	0.095
	Comparison	1.950	0.224	
Organization	AN	1.097	0.396	0.105
	Comparison	1.300	0.470	
Focal attention	AN	1.032	0.442	0.216
	Comparison	1.200	0.410	
Affective contact	AN	0.936	0.359	0.098
	Comparison	1.100	0.308	
LTPc phase 3: Father + Daughter + Mother				
Participation	AN	1.516	0.769	0.005**
	Comparison	2.000	0.000	
Organization	AN	0.807	0.601	0.000**
	Comparison	1.450	0.510	
Focal attention	AN	1.0	0.683	0.036**
	Comparison	1.4	0.503	
Affective contact	AN	0.871	0.5	0.037**
	Comparison	1.150	0.366	
LTPc phase 4: Father + Mother – Daughter				
Participation	AN	1.387	0.803	0.001**
	Comparison	2.000	0.000	
Organization	AN	0.581	0.72	0.000**
	Comparison	1.350	0.587	
Focal attention	AN	0.581	0.564	$7.172*10^{-5}$**
	Comparison	1.300	0.470	
Affective contact	AN	0.71	0.529	0.004**
	Comparison	1.100	0.308	

Statistical significance was attributed in case of $p < 0.05$

noticed that participation exhibits a greater influence on the total scores in both groups.

3.2. Differences of the groups between the phases

Statistically significant differences between the two groups emerged in various phases, showing that AN families exhibit more dysfunctional performances than comparison group.

Further statistics analysis allowed us to unveil the behavior of family members in both groups in each phase, according to participation, organization, focal attention, affective contact. In particular, we point out that in phase 1 AN group exhibits a worse functioning than parallel group in Focal attention and Affective contact, in phase 2 there are no statistically significant differences, while in both phases 3 and 4 we found lower scores in the AN group than comparison group (Table 3).

Considering the influence of each phase on the general LTPc score, we conducted the analyses for each of the two groups individually to understand which phase has the greatest impact on the functional profile of the two types of family and, specifically, which affects the worst performance of AN families. We have found that in the AN families it is not possible to identify a phase that mainly influences the type of family alliance, since all four phases negatively affect the worst functioning in equal measure. Therefore, it is emphasized that the influence of the phases weighs less in the total score of the AN group than in the comparison group. (Table 4).

3.5. Multivariate Analysis

In this part, we applied a logistic regression on our LTPc data,

Table 4
Influence of phases overall the total score in both groups considered individually

LTPc phases		*Mean*	*SD*	*p-value*
LTPc 1	AN	6.194	1.302	0.006**
	Comparison	7.200	1.105	
LTPc 2	AN	6.097	1.248	0.037**
	Comparison	7.050	1.276	
LTPc 3	AN	5.097	2.612	6.429^{e-05}**
	Comparison	7.650	1.268	
LTPc 4	AN	5.097	2.612	3.623^{e-05}**
	Comparison	7.650	1.268	

Statistical significance was attributed in case of $p < 0.05$

Table 5
Estimated coefficients and *p*-value for the logistic regression

LTPc phases	*Estimated Coefficients*	*Standard Error*	*p-value*
Intercept	-33.3141	12.8787	0.00969 **
Participation	-2.3578	0.8842	0.00766 **
Organization	-1.0232	0.5314	0.05418
Focal attention	0.5074	0.6561	0.43931
Affective contact	-3.3803	1.5703	0.03134 *

considering the group membership as target variable. This type of analysis identifies, in a multivariate way, which variables influence more the group membership. Observing the coefficients, as we are considering as group 1 the AN cases, it is possible to notice that higher value of participation and affective contact imply higher probability of belonging to the control group (Table 5). When evaluating the influence of each variable in a multivariate way only participation and affective contact are significant in discriminate between the two groups. Observing the Spearman correlations coefficients among variables (Table 6) we can notice that both organization and focal attention correlated with Affective contact, thus this last variable include also the influence of the other two. *p*-values are significant for all the correlation coefficients.

4. Discussion

The comparison between families of patients suffering from AN and families of adolescents affected by emotional and behavioral disorders of adolescence led us to confirm, also based on a semi-standardized observational method, the greater presence in AN, of family dysfunctional interactive models (McDermott et al., 2002; Gillet et al., 2009; Sim et al., 2009; Holtom-Viesel and Allan, 2014). In line with previous data (Balottin et al., 2017), families of patients with AN failed in enjoying the LTP game as a triad. Disturbed and collusive families generally present a parents' coalition aimed at diverting their conflict on their offspring, which often hold the role of mediator. The narrative plot appeared fragmentary, disjointed and marked by various suspensions, as the goal was not the triadic enjoyment but an open or hidden competition. The game session, in fact, often ended in a breach or impasse.

Furthermore, the greater influence of participation and

Table 6
Spearman correlation coefficients among variables

LTPc phases	Participation	Organization	Focal attention	Affective contact
Participation	1	0.4476416	0.4767819	0.2933964
Organization		1	0.8043552	0.5734061
Focal attention			1	0.7340726
Affective contact				1

organization, which represent the basic functional levels, on the total scores in AN families could be due to the members' difficulty to coordinate and alternate, coherent with transitions from one phase to another appearing rigid and forced, with different game plots for every phase. At the same time, the duration of the procedure was often not appropriate (too short or too long).

Considering the organization, in our clinical sample, some mothers did not capture the requests of their daughter and so they determined according to their own view the content and the style of the activity. When assuming the role of observer, these mothers showed the tendency to substitute the other parent, somehow expressing disagreement and opposition. Daughters tended to ask for mother's help in order to continue the game, while fathers usually released themselves. This paternal weakness may stand for a defensive reaction in front of the daughter's illness, but at the same time it may entail a less affective connection and it can influence the quality of family interactions and the AN outcome (Balottin et al., 2014).

Adolescents affected by emotional and behavioral disorders and their families showed a more disharmonious profile, characterized by lower values in the affective contact, the superordinate and more complex functional level, compared to better performances in the other functional levels. On the other hand, AN families exhibited a much more harmonic profile, characterized by globally low scores in all levels. In fact, if they failed in the first functional levels (participation and organization) they could not later be in emotional contact. Vice versa, the other group's performances were lacking only in the affective contact because their psychopathology influenced the emotional expressivity.

Moreover, our results allowed us to unveil how the two groups differ individually in each phase. In particular, in phase 1 (mother-daughter dyad) AN families frequently excluded the father when he was the observer, or the father himself did not pay any attention to what is happening around him, undertaking different lonely activities (i.e. answering the phone).

Considering the dyadic phase 2 (father-daughter dyad), we noticed that family functioning was quite like comparison's one. This may imply that when fathers took on an active role, they managed to improve the whole family functioning.

The most significant differences appeared in the third and fourth phases. Families had troubles in functioning as “three together” with a strong tendency of dyadic functioning supplied with the exclusion of one participant. Parents were not able to interchange themselves, as well as to coordinate and support each other. In addition, some daughters contributed to create a separation between their parents. Nevertheless, we also recorded a few patients' attempts to include both parents in the game and to establish a real alternation; in these cases, however, the conflict between the parents often prevented parents and daughter from respecting the reciprocal ventures and from reaching an adequate coordination. Moreover, considering the fourth phase, the daughter was frequently included, even if parents were supposed to interact only as a couple.

Finally, the possibility of identifying, through LTPc, a distinctive profile of the AN families is of considerable importance. Coring in participation and affective contact may help discriminating AN families from families with daughter with different emotional and behavioral problems: the participation level is in fact specifically compromised only in AN families. It is therefore worth noting that LTPc profiles and multivariate analysis might help clinicians discriminate different family patterns which specifically pertain to families with daughter diagnosed with AN. This could stimulate the emergence of new research projects aimed at promoting screening to prevent the onset of such a risky disease.

To sum up, our study identified specific dysfunctional dynamics exhibited in different relational configuration (phases of the play) by families with daughters with AN compared with a different clinical comparison group of families with daughters with emotional and behavioral disease. In particular, the participation and the affective contact functional level could better differentiate these two groups of families.

This suggests that LTPc can be an adequate and little expensive instrument in order to allow an impartial and standardized interpretation of family dynamics. Indeed, unlike many studies, as reported in a meta-analysis (Anastasiadou et al., 2014), LTPc procedure allows clinicians to focus on the role of all family members, giving the role of the father the same importance reserved for the mother's one. In fact, as many researches proved, the whole family contributes not only in the disease's pathogenic mechanism and in its maintenance, but also as a therapeutic strength.

As a clinical implication, we would also stress the innovativeness of LTPc as preventive tool. Thanks to the predictive model, specific types of alliance and functioning during the four phases could foresee the risk of developing AN rather than other diseases, intervening as early as possible. Finally, by means of the LTPc procedure, clinicians could shed a light not only on family difficulties, but also on their strengths in order to decide which type of intervention is the most suitable, with the aim of improving the prognosis of a disorder that frequently tends to persist and to be pretty invalidating.

Further projects would overhaul a possible limit of this study, enlisting different control groups, maybe including males, in order to demonstrate that the LTPc procedure could be helpful not only to identify specific diseases, but also to see the effectiveness of the therapies during later follow-up video feedback sessions.

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Declaration of Competing Interest

None.

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Clinical features of adolescents diagnosed with eating disorders and at risk for psychosis

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Abstract

Background. The presence of subthreshold psychotic symptoms in adolescents with eating disorders is poorly described. This study provides a detailed characterization of adolescents affected by eating disorders in the absence or presence of subthreshold psychotic symptoms, taking into account a wide set of sociodemographic, psychological, and clinical variables.

Methods. Ninety-four adolescents diagnosed with eating disorders were interviewed, focusing on clinical anamnesis and sociodemographic data collection. The Comprehensive Assessment of At-Risk Mental States (CAARMS) was used to assess the presence (HR+) or absence (HR−) of subthreshold psychosis. The clinicians completed a questionnaire on eating disorders severity, whereas patients provided self-report measures of global social functioning and psychological symptoms associated with eating disorders.

Results. Attenuated psychotic symptoms were highly frequent (84% of subjects). HR+ patients experienced more frequently purging behaviors and dysmorphophobia and received a greater amount of antipsychotic drugs. Compared to HR− counterparts, HR+ patients reported higher eating disorders severity and psychological symptoms (i.e., ineffectiveness, interpersonal and affective problems) associated with eating disorders. Finally, a significant correlation between global social functioning and eating disorders severity emerged only for HR− subjects.

Conclusions. These descriptive data are warranted to identify a potential psychotic core in eating disorders, mainly concerning body image and weight as well as specific psychological features. The availability of reliable and valid markers of risk can further increase our capacity to detect the early emergence of psychosis in adolescents with eating disorders, whose outcome might be worsened by the presence of psychotic symptoms.

Introduction

Eating disorders are a heterogeneous group of potentially severe and often chronic pathologies, accompanied by an important impairment of global, social, and labor functioning [1]. They are among the most common chronic mental illnesses in adulthood, but they show a high incidence rate and a peak onset in adolescence, between the ages of 14 and 19 [2]. The healthcare journey of these patients is usually prolonged and requires a multispecialist care team. In addition, they are associated with up to 9.4% rate of mortality (1.8% in adolescents) after more than 10 years of follow-up, with a fifth of them being suicidal deaths [3].

It is widely known that eating disorders are frequently comorbid with other psychiatric disorders, with a lifetime prevalence, in subjects with anorexia nervosa, between 45 and 97% [2]. The presence of other psychiatric disorders usually correlates with less favorable outcomes, exacerbating the severity of eating disorders and favoring its chronicity [2,4]. Research to date has ascertained that eating disorders often show significant associations with axis I or II psychiatric disorders—that is, anxiety and depression—in percentages that settle between 80 and 97% of cases [5]. Notwithstanding, the co-occurrence or comorbidity between eating disorders and psychosis is far less investigated, especially in children and adolescents, as findings mostly refer to sporadic adult clinical cases [6–8] which prevent definitive conclusions from being drawn [9]. In a recent study, Solmi and colleagues [9] reported on the significant association between psychotic experiences and eating disorders in a cohort of adolescents, suggesting that psychotic symptoms may be considered as markers of increased risk for more severe psychopathology in late adolescence.

This lack of knowledge is quite surprising. Precocious screening and identification of those who are at risk for full-blown as well as for attenuated forms of psychosis is a priority goal in psychiatric practice with adolescent patients. Additionally, subjects with attenuated forms of psychosis have been found to have a 30% higher probability of developing full-blown psychosis (e.g., schizophrenia) in the following 2 years [10], and they may show reduced response to treatments, especially during adolescence [9,11]. Both a recent large cohort study of more than 6,000 patients [12] and a

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systematic review of the literature support the hypothesis that eating disorders and psychosis share genetic liability and common phenotypic risk factors. In line with this hypothesis, it is possible to consider eating disorders—and especially anorexia nervosa—as characterized by the intense fear (anxiety) of fattening and delusional beliefs about food, as well as the presence of a distortion of the body image (dysmorphophobia) [6,7].

To sum up, despite clinical evidence suggests a possible overlap between eating disorders and psychosis, to date, the potential association between these two psychiatric entities is not fully defined in adolescents. More specifically, there is no systematic investigation of this association and its clinical implications when psychotic symptoms are present in attenuated forms. The present study aimed at providing a detailed characterization of adolescent patients diagnosed with eating disorders in the absence or presence of psychotic symptoms, taking into consideration a wide set of sociodemographic, psychological, and clinical variables. The specific goals were: (a) to assess the psychological functioning and the severity of the eating disorder in adolescents with or without psychotic symptoms and (b) to explore the associations between neonatal, sociodemographic, clinical, and psychological functioning variables with eating disorders severity in the two groups. To the best of our knowledge, this investigation would provide for the first time in literature an overall picture of the specificity of eating disorders conditions in the absence or presence of psychosis risk.

Methods

Participants

Ninety-four adolescent patients diagnosed with eating disorders were consecutively enrolled between May 2013 and October 2019 at the Child Neurology and Psychiatry Unit of the IRCCS Mondino Foundation, Pavia, Italy and at the Child and Adolescent Mental Health, San Gerardo Hospital, Monza, Italy. Inclusion criteria were a diagnosis of anorexia nervosa or other restrictive unspecified eating disorders according to Diagnostic Statistical Manual (DSM-5) and age between 12 and 18 years. Subjects were excluded from the study if they presented at least one of the following exclusion criteria: mental retardation, diagnosis of psychotic disorders prior to the enrollment, neurological pathologies, brain injuries, or other medical conditions associated with psychiatric symptoms. The study received the approval of the participating hospitals. All the procedures are consistent with the principles of the World Medical Association Declaration of Helsinki. All the enrolled patients provided written informed consent to participate in the study.

Procedures

The access of the patients to the hospital units could be for hospitalization, day hospital, and/or outpatient visit. After providing written informed consent, the patients were interviewed by a trained child psychiatrist. The interview focused on (a) clinical anamnesis and sociodemographic data collection and (b) a pool of questionnaires designed to obtain quantitative measures of specific clinical features: eating disorders severity, global social functioning, associated psychological symptoms, and risk of psychosis.

Measures

Preliminary data

The following sociodemographic and clinical characteristics were obtained: age at enrollment, weight and height at enrollment, parental education level, parental job, parental marital status, eating disorders onset age, previous history of eating disorders and any other neuropsychiatric disorders, quality of social relationships and school adjustment, risky behaviors, menarche, irregular period, presence of elimination conducts, binge-eating and/or dysmorphophobia, psychiatric comorbidities, and any drug treatment. Height and weight at enrollment were used to compute the body mass index (BMI). Parental education level and job were used to compute the socioeconomic status index according to Hollingshead [13].

Eating disorders severity

The eating disorders severity was measured according to the Morgan-Russell Outcome Assessment Schedule (MROAS) [14]. This scale was previously used in Italian samples of adolescents with eating disorders [15]. The MROAS is a clinical observational scale to assess the clinical outcome of the eating disorders. It includes 10 items rated on a 4-point Likert scale ranging from 1 (satisfying) to 4 (very unsatisfying). A global outcome score ranging from 10 (good) to 40 (poor) is obtained. This scale was filled in by the child neuropsychiatrist.

Global social functioning

The assessment of the global social adjustment of the patients was obtained through the clinician-rated Children's Global Assessment Scale (C-GAS) [16]. The Italian version has been used in previous samples of adolescents with psychiatric morbidities [17]. The scale is separated into 10-point sections that are headed with a description of the level of global functioning and followed by examples matching the given interval. The final score ranges from 1 (the most impaired level of global functioning) to 100 (the superior level of global functioning).

Psychological symptoms associated with eating disorders

The Eating Disorder Inventory (EDI-3) [18] is a 91-item self-reporting questionnaire intended to provide a psychological profile of symptoms related to eating disorders and a quantitative measure of their presence and intensity. The Italian version of the EDI-3 [19] provides six composite scales: Eating Disorder Risk Composite (EDRC), Ineffectiveness Composite (IC), Interpersonal Problems Composite (IPC), Affective Problems Composite (APC), Overcontrol Composite (OC), and General Psychological Maladjustment Composite (GPMC). For each composite scale, higher scores reflect worse symptomatology.

Risk of psychosis

The Comprehensive Assessment of At-Risk Mental States (CAARMS) [20,21] is a 27-item semistructured interview that provides a quantitative index of risk for full-blown and attenuated psychosis in psychiatric patients. It is a clinical tool devised also to exclude or confirm the diagnosis of an acute psychotic episode, and its Italian version is validated [22]. The CAARMS gives a comprehensive picture of the patient's premorbid state; the patient is asked to consider the previous 12 months and the period characterized by the maximal severity of the symptoms as a reference for answering the items. The items assess several psychopathological and functional features grouped into subscales: positive symptoms, cognitive alterations, emotional disturbances, negative symptoms, behavioral changes, somatic-motor changes, and general psychopathology. Each subscale is rated on a 6-point Likert scale that ranges from 0 (absence of symptoms) to 6 (daily present or high-intensity symptoms). A score for attenuated positive psychotic symptoms is obtained by summing up the points scored in the first

three subscales. According to the CAARMS, the sample was split into two groups: no psychotic risk (HR−) and psychotic risk (HR+). The PPS group included both subjects with attenuated psychotic symptoms and full-blown psychotic illness.

Plan of analysis

Among the 94 adolescents included in the study, four (4%) had a diagnosis of full-blown psychosis, and they were removed from the present study. As such, the final sample size for statistical analysis was $N = 90$. The two groups (HR−, HR+) were compared for neonatal, sociodemographic, and clinical characteristics by means of χ^2 test (categorical variables) and independent-sample t test (continuous variables). Independent-sample t tests were used to compare the two groups for C-GAS and MROAS scores. A multivariate analysis of variance (MANOVA) was used to compare the EDI-3 dimensions between the two groups. To investigate the differential associations between neonatal, sociodemographic, clinical, and psychological functioning variables with the eating disorders severity, a series of Pearson's bivariate correlations were carried on the whole sample as well as separately for the two groups. In order to adjust for multiple testing, we used the Benjamini–Hochberg false discovery rate procedure to correct for the number of bivariate correlations tested reporting significant associations, setting an adjusted q-value of 0.05. All the analyses have been carried with IBM SPSS 25 setting $p < 0.05$.

Results

Descriptive statistics and test statistics for the neonatal, sociodemographic, and clinical variables are reported in Table 1 for the two groups. About 11 subjects were outpatients, 18 were in day hospital, and 65 were hospitalized. The BMI was below the 15th percentile for four patients in the HR− group (27%) and 28 patients in the HR + group (35%), $\chi^2 = 3.25$, $p = 0.354$. Higher presence of purging behavior (i.e., elimination conducts) and dysmorphophobia emerged for the HR+ group, compared to HR− counterparts. Moreover, HR+ patients used greater amount of drug treatments, especially antipsychotic medications.

The MROAS, C-GAS, and EDI-3 scores for the whole sample and the two groups are reported in Figure 1. Significant differences emerged for the MROAS, $t(88) = -4.56$, $p < 0.001$. The patients in the HR+ group had greater MROAS score compared to the HR− counterpart. No significant differences emerged for the C-GAS score, $t(88) = -1.24$, $p = 0.219$. A multivariate significant effect emerged for the EDI-3, $F(6,80) = 4.19$, $p = 0.001$, $\eta^2_p = 0.24$. Significant group differences emerged for IC, $F(1,85) = 5.42$, $p = 0.022$, $\eta^2_p = 0.06$, IPC, $F(1,85) = 4.49$, $p = 0.037$, $\eta^2_p = 0.05$, and APC, $F(1,85) = 4.65$, $p = 0.034$, $\eta^2_p = 0.05$.

After correcting for multiple comparison bias, correlational analyses revealed that MROAS score was significantly and negatively associated with BMI in the whole sample, $r = -0.44$, $p < 0.001$, and both in HR−, $r = -0.55$, $p = 0.035$, and HR+ patients, $r = -0.40$, $p < 0.001$. C-GAS score significantly and inversely correlated with MROAS score only in the HR− group, $r = -0.71$, $p = 0.005$ (Figure 2).

Discussion

Attenuated psychotic symptoms appeared to be highly frequent in the subjects with eating disorders enrolled in our study: in fact, they were present in 79 out of 94 adolescents (84%). This finding is consistent with previous research suggesting that the comorbidity between psychosis and eating disorders may be at least partially due to overlapping common psychological processes distorting reality perceptions that are common of anorexia nervosa and psychotic symptoms [4]. Moreover, these patients received greater amount of antipsychotic drugs with respect to non-at-risk counterparts. Nonetheless, future research is warranted to investigate whether adolescents with eating disorders and subthreshold psychotic symptoms could mainly benefit from taking antipsychotic drugs with respect to patients who are not at-risk for psychosis.

Comorbidity between eating disorders and psychotic symptoms

As for the main aims of the study, the findings are reminiscent of a potential psychotic core, concerning body image and weight as well as psychological characteristics. First, we found that impulsive behavior (e.g., purging acts) was much more frequent among at-risk patients. It is relevant to underline that purging behavior in eating disorders is considered as a predictor of poor outcome, associated with delayed time to remission, long duration of illness, greater psychopathology, and higher psychological distress [23,24]. Moreover, impulsivity is a common feature of subjects who are at risk for psychosis [25]. Consistently, we hypothesize that the described impulsiveness of subjects at risk of psychosis, together with a fragility of thought organization, leads to a greater behavioral discontrol, which is observed in terms of greater purging behaviors frequency in these patients.

Second, patients with psychotic symptoms also reported a higher proportion of poor academic achievements and school withdrawal. Research into the cognitive performance and academic achievements of adolescents with eating disorders is limited. Previous research suggests that adolescents with problems in body image and disordered eating behavior are at higher risk for academic interference and lower grade point average [26]. In the same study, the severity of eating disorder symptoms was positively correlated with school maladjustment. Consistently, while academic interference may be a relatively unexamined, yet potentially relevant outcome for individuals who experience eating problems, the present findings suggest that the comorbid presentation with subthreshold psychotic symptoms may further exacerbate the risk of academic failure and school withdrawal.

Third, dysmorphophobia was also much more frequent among patients at risk for psychosis, despite this difference only reached marginal significance. This finding is in line with current literature: distortions of body image are among the most common psychotic symptoms reported in association with eating disorders [5,27]. They play an important role in the development, maintenance, and severity of the eating disorder itself [28,29]. These symptoms are described in previous reports on adult population as the most pervasive, the first that occur (about 6 months before the diagnosis) and the most difficult to treat [27,30]. Nonetheless, replication in larger cohorts is needed to further confirm the significance of this finding.

Factors influencing the link between eating disorders severity in patients with and without psychotic symptoms

Higher eating disorders' severity emerged for patients at risk for psychosis, especially in presence of low BMI. This finding further suggests the presence of a link between the severity of the eating disorder and the risk of psychotic subthreshold features. To the best

Table 1. Descriptive statistics and clinical characteristics of the sample.

	Groups					
	HR− (*N* = 15)		HR+ (*N* = 79)		Group comparison	
	Mean	SD	Mean	SD	*t* test	sig
Age (years)	15.13	2.31	15.53	1.28	0.96	0.338
Eating disorder onset age (years)	14.37	1.82	14.35	1.86	0.04	0.966
Weight (kg)	41.38	7.22	41.39	5.98	0.01	1.000
BMI (kg/m^2)	16.28	2.26	15.89	2.08	0.65	0.515
Socio-economic status (range: 0–90)	38.00	16.05	31.71	14.16	1.50	0.137
	N	%	*N*	%	χ^2 test	sig
Parental marital status (separated/divorced)	5	33.3	12	15.2	2.80	0.094
Quality of social relationship (withdrawal or limited)	6	40.0	29	36.7	0.93	0.628
School adjustment (withdrawal or poor)	2	13.3	38	48.1	10.47	0.033
Previous history of eating disorders (yes)	4	26.7	15	19.0	0.46	0.497
Previous history of neuropsychiatric disorders (yes)	3	20.0	22	27.8	0.43	0.512
Risky behaviors (yes)	2	13.3	16	20.3	0.42	0.519
Menarche (no)	2	13.3	7	8.9	0.29	0.589
Period (amenorrhea or irregular)	13	86.7	75	94.9	2.47	0.481
Elimination conducts (yes)	2	13.3	38	48.1	6.23	0.013
Binge-eating (yes)	3	20.0	14	17.7	0.04	0.834
Dysmorphophobia (yes)	12	80.0	74	93.7	3.03	0.082
Main diagnosis (anorexia nervosa)	10	66.7	65	82.3	1.91	0.167
Psychiatric comorbidity (yes)	8	53.3	28	35.4	1.71	0.191
Anti-depressant drug treatment (yes)	5	33.3	25	31.6	0.02	0.898
Anxiolytic drug treatment (yes)	1	6.7	11	13.9	0.60	0.440
Anti-psychotic drug treatment (yes)	1	6.7	37	46.8	8.45	0.004

Abbreviations: BMI, body mass index; HR−, no psychotic risk; HR+, psychotic risk.

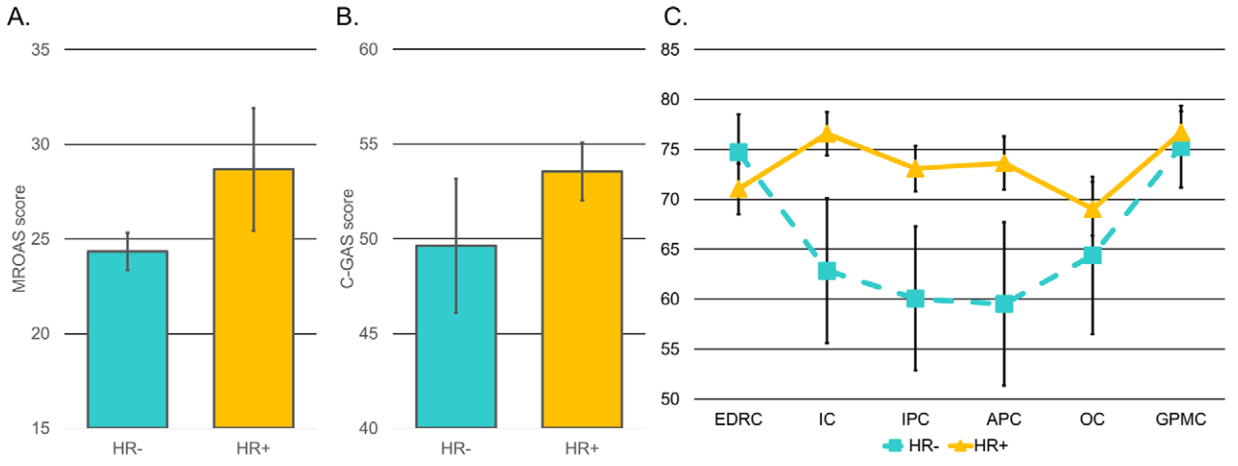

Figure 1. Mean differences in (1A) MROAS, (1B) C-GAS, and (1C) EDI-3 scores between HR− and HR+ eating disorders patients. Abbreviations: APC, Affective Problems Composite; C-GAS, Children's Global Assessment Scale; EDI-3, Eating Disorder Inventory; EDRC, Eating Disorder Risk Composite; GPMC, General Psychological Maladjustment Composite; HR−, no psychotic risk; HR+, psychotic risk; IC, Ineffectiveness Composite; IPC, Interpersonal Problems Composite; MROAS, Morgan-Russell Outcome Assessment Schedule; OC, Overcontrol Composite. Bars represent standard errors.

of our knowledge, our finding is the first report on this association in adolescents. A potential and clinically relevant speculation regards the hypothesis that patients with eating disorders who also are at risk for psychosis may present greater thought disorganization which in turn might limit the effectiveness of therapeutic interventions [31].

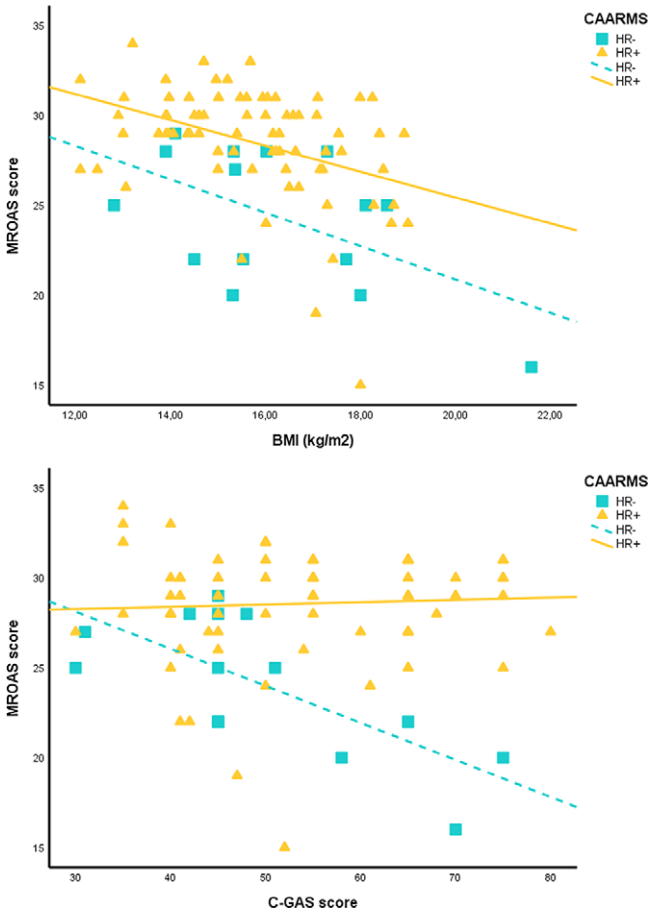

Figure 2. Association of MROAS score with (2A) BMI and (2B) C-GAS score in HR− and HR+ eating disorders patients. Abbreviations: BMI, body mass index; C-GAS, Children's Global Assessment Scale; HR−, no psychotic risk; HR+, psychotic risk; MROAS, Morgan-Russell Outcome Assessment Schedule.

Notably, a significant association between the severity and global social functioning emerged in patients without risk of psychosis but not in at-risk subjects. We speculate that in the presence of subthreshold psychotic symptomatology, the overall psychological functioning —including relational, social, and school adaptation—is probably much more affected by the frequency and the intensity of psychotic symptoms rather than by features specific of eating disorders [32].

Specific psychological symptoms emerged associated with risk of psychosis in patients with eating disorders. This symptom constellation was characterized by more severe self-perceived ineffectiveness, interpersonal, and affective problems. As such, it could be hypothesized that the attenuated psychotic symptoms observed in a wide proportion of patients with eating disorders may be a proxy of the psychopathological severity and complexity of the eating disorder (e.g., multiple comorbidities, worse overall functioning).

Partially surprising, the global psychological functioning did not differ between the two groups. It should be highlighted that patients with full-blown psychosis, a condition that usually correlates with poor global psychological functioning, were not included in the sample because of limited sample size. At-risk patients presented only subthreshold psychotic symptomatology, identifying a condition that does not necessarily determine a poor global functioning, especially during the early stages of the disorder. This may partially explain the absence of significant difference between the two groups.

Limitations and future directions

There are several limitations that should be considered when interpreting our results. First, sample size did not allow us to compare subthreshold and full-blown psychosis subjects. Notably, full-blown psychosis is described to occur sporadically in adult patients with eating disorders [33], whereas there is no systematic report of its prevalence in adolescence. Second, this study aimed at describing the overlapping and comorbid presentation of eating disorders and psychotic symptoms in adolescents; as such, no data are reported on follow-up and the outcome of the healthcare journey of these patients, in particular about the transition rate risk to full-blown psychosis. As previous studies in other populations reported 30% transition rate to full-blown psychosis within 2 years from the initial assessment [10], future research should report the transition rate risk in adolescent patients with eating disorders and subthreshold psychotic symptoms. Third, in the present sample, we were not able to collect complete data about the effects of different treatment options, including pharmacotherapy, on the developmental outcomes of the patients. We suggest that this should be prioritized in future research in the field.

Conclusions

The present study described a multidimensional psychotic core that can have relevant implications for clinical practice with adolescents with eating disorders who are at risk for psychosis. First, the availability of reliable and valid markers of risk can further increase our capacity to detect early emergence of psychosis in adolescents with eating disorders. This study highlights specific dimensions of psychological functioning that can be easily detected by the clinician during anamnestic interviews. More specifically, the present study confirmed that the CAARMS should be regarded as a tool of relevant clinical utility for identifying prodromal psychotic symptoms even in adolescents with eating disorders [34]. We strongly suggest to include CAARMS interview into the ordinary diagnostic assessment of eating disorders. Second, this study may be considered as a first step forward to identify specific psychological dimensions (i.e., inadequacy feelings, interpersonal, and affective regulation problems) that can be the focus of preventive and early intervention strategies. As future research will corroborate and extend our knowledge of the psychotic core in adolescents with eating disorders, these findings are warranted to crucially support the early characterization of patients' symptoms and needs, the clinicians' decision-making, and the development of individualized and tailored treatments.

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Abbreviations

APC	Affective Problems Composite
C-GAS	Children's Global Assessment Scale
EDI-3	Eating Disorder Inventory
EDRC	Eating Disorder Risk Composite
GPMC	General Psychological Maladjustment Composite
HR−	no psychotic risk
HR+	psychotic risk
IC	Ineffectiveness Composite
IPC	Interpersonal Problems Composite

MROAS Morgan-Russell Outcome Assessment Schedule
OC Overcontrol Composite

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Conflicts of Interest. The authors have no conflicts of interest to disclose.

Data Availability Statement. Data are available upon reasonable request to the corresponding author.

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RESEARCH ARTICLE

WILEY

Are family relations connected to the quality of the outcome in adolescent anorexia nervosa? An observational study with the Lausanne Trilogue Play

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The study aims to explore the connection between the family interactive patterns, investigated with a standardized observational tool based on a recorded play session, the Lausanne Trilogue Play, and the outcome of adolescent patients with anorexia nervosa after a 6 months treatment, based on the Morgan–Russel Outcome Assessment Schedule. Seventy-two parents and adolescent daughters with anorexia nervosa, consecutively referred to an adolescent neuropsychiatric service, participated in the study and underwent an integrated model of treatment, based on constant neuropsychiatric and dietary monitoring, weekly individual psychotherapy for the daughter, and parental counselling and support. A better adolescents' functioning in family relationships, in particular in the triadic ones, at first assessment, was associated with a better outcome. Data on family interactions may help predict the most appropriate intervention for the patient and his family.

KEYWORDS

adolescence, Morgan–Russel Outcome Assessment Schedule (MROAS), restricting-type anorexia nervosa, treatment outcome, triadic interactions

1 | INTRODUCTION

Anorexia nervosa is an eating disorder whose onset appears at an increasingly early age and whose prognosis, even among adolescents, can be severe, with a 1.8% percentage of mortality in patients with onset within the first 18 years, which grows with age (Steinhausen, 2009). The chronicization rate in the early-onset forms is also rather high (16.9%, Steinhausen, 2009). However, 40% of cases of anorexia have their onset between 15 and 19 years of age (Micali, Hagberg, Petersen, & Treasure, 2013; Smink, Van Hoeken, & Hoek, 2012), an age range that also features the highest recovery rates (Ackard, Richter, Egan, & Cronemeyer, 2014). Treating this serious and potentially deadly psychopathology in a timely and effective manner can therefore be crucial (Vall & Wade, 2015) and research in this field can substantially increase the range of available interventions and the effectiveness of their application in different clinical situations. In a meta-analysis including also cases of adolescents, Vall and Wade (2015) identified the intensity of symptoms' change during the early phases of treatment as the best outcome predictor, both at the end of therapy and at follow-up. The authors pointed out that a higher body mass index (BMI) at the onset, reduced behaviour of binge/purge, higher motivation to cooperate to the recovery process, low level of depression and concern about body image and weight, less co-morbidities, better functioning in interpersonal relationships, and fewer family problems contribute to a favourable prognosis.

A great deal of convergent literature data suggest that family components can play an important role both in the complex pathogenic and maintenance mechanisms of anorexia nervosa, and even more in the therapeutic treatments that are seen as the most effective for patients with anorexia (Lyke & Matsen, 2013; Ravi, Forsberg, Fitzpatrick, & Lock, 2009; Rodríguez Martín, Novalbos Ruiz, Martínez Nieto, Escobar Jiménez, & Castro De Haro, 2004). Parental involvement in the adolescent treatment is recognized to have a pivotal role in the outcome of anorexia nervosa and is supported by the main

guidelines for the management of the disorder (American Psychiatric Association, 2006; Espie & Eisler, 2015; Hay et al., 2014; Herpertz-Dahlmann, van Elburg, Castro-Fornieles, & Schmidt, 2015; Lock et al., 2015; National Institute for Health and Care Excellence, 2017). Family therapies, such as the family-based therapy or the Maudsley family therapy (Le Grange & Eisler, 2009; Murray & Le Grange, 2014), have their roots in the systemic approach (Minuchin et al., 1975; Selvini Palazzoli, 1989) along with the behavioural one; they have shown high levels of efficacy in the treatment of anorexia nervosa and in particular of adolescents (Couturier, Kimber, & Szatmari, 2013; Fisher, Hetrick, & Rushford, 2010). Early studies (Wallis, Rhodes, et al., 2017) investigating the therapeutic process and the changing mechanisms in family-based therapy showed that relational containment and parental confidence may play a pivotal role in enhancing the adolescent physiological individuation and autonomy process. Moreover, there is preliminary evidence that supports also therapeutic methods coming from different theoretical approaches, such as the systemic family therapy (Agras et al., 2014) or the dynamic family therapy of the Montsuris (Paris)-based group (Godart et al., 2012). This latter model of family therapy is based specifically on the intrafamily relationships and on adolescence issues instead than on the eating behaviours; it proved to be effective in reducing feeding symptoms and in improving the general psychopathological functioning, as measured by the Morgan–Russel Outcome Assessment Schedule (MROAS; Morgan & Hayward, 1988) adapted to adolescent patients (Jeammet, Brechon, Payan, Gorge, & Fermanian, 1991). In short, it is well established that family therapy models work, but it is still unclear why they work, and if there are specific family dynamics to be targeted and modified in order to facilitate a positive outcome for the patient. Studies on interactive processes in these families may help to clarify the issue (Wallin & Kronvall, 2002; Wallis, Miskovic-Wheatley, et al., 2017).

Several studies, based on different questionnaires, have described the family functioning perceived by patients with eating disorders and, to a lesser extent, by the patients' parents and siblings as well (Holtom-Viesel & Allan, 2014). Based on a systematic review (Holtom-Viesel & Allan, 2014), families of patients with eating disorders report a more dysfunctional functioning compared with families without a child with eating disorders; however, different eating disorders do not seem to present distinct patterns in this respect (Gillett, Harper, Larson, Berrett, & Hardman, 2009; McDermott, Batik, Roberts, & Gibbon, 2002). Parents of patients with eating disorders, especially of those with anorexia nervosa (Sim et al., 2009), not only experience greater family conflict, but also feelings of stress and depression. In addition, patients perceive the family functioning even more negatively than their parents (Dancyger, Fornari, Scionti, Wisotsky, & Sunday, 2005). According to longitudinal studies (Gowers & North, 1999; Woodside, Lackstrom, Shekter-Wolfson, & Heinmaa, 1996), a poorer perception of family functioning on the patient's part seems to worsen the outcome of treatments offered, as confirmed by two studies (Ciao, Accurso, Fitzsimmons-Craft, Lock, & Le Grange, 2015; Wallis, Miskovic-Wheatley, et al., 2017) published after the systematic review conducted by Holtom-Viesel and Allan (2014).

The majority of studies reviewed by Holtom-Viesel and Allan (2014), however, displayed some limitations linked to the cross-sectional design, and primarily to the exclusive use of self-report measures: this was the case of as many as 82% of the studies, although this kind of measures are known to be affected by social desirability and denial (Balottin et al., 2016; Gatta et al., 2017; Mannarini, Balottin, Toldo, & Gatta, 2016). It is also clear that self-report questionnaires capture the family components' perceptions and viewpoints, which may largely differ from the observers' ratings of the family interactions (Balottin, Nacinovich, Bomba, & Mannarini, 2014). However, two (Ciao et al., 2015; Wallis, Miskovic-Wheatley, et al., 2017) out of three studies (Ciao et al., 2015; Wallis, Rhodes, et al., 2017; Wallis, Miskovic-Wheatley, et al., 2017) following the cited systematic review (Holtom-Viesel & Allan, 2014) applied only self-report measures, whereas one study applied an ad hoc qualitative interview (Wallis, Rhodes, et al., 2017). Moreover, few studies applied observer-rated measures along with the self-report ones, and demonstrated that the families of patients with anorexia perceived their functioning to be better than the observers' ratings (Gowers & North, 1999; Wallin & Hansson, 1999). Gowers and North (1999) applied a structured interview for measuring family functioning along with questionnaires, whereas a videotaped observational measure was part of the test battery of the Wallin and Hansson's (1999) study, which found families of young patients with anorexia to be more overinvolved and rigid than families belonging to the control group. The latter, however, were not matched for age nor for other characteristics to the families with a daughter with anorexia; despite this important limitation, according to the authors (Wallin & Hansson, 1999), differences between the family groups suggested that families of patients with anorexia were overall more dysfunctional than nonclinical families. In line with the description by Minuchin et al. (1975) and Minuchin, Rosman, and Baker (1978), the parental subsystem did not appear to be differentiated enough, and the boundaries between generations seemed so fragile that coalitions might emerge across them. Nevertheless, the families of daughters with anorexia differed from each other and did not fit a single prototypical model. In a subsequent study, Wallin and Kronvall (2002) assessed the families of patients with anorexia after a family treatment and found that they had improved towards a more adaptive functioning. These results support the hypothesis that the recovery from anorexia may benefit from an improvement of the family functioning, and focus attention on the prognostic family factors that can influence the treatment outcome (Ciao et al., 2015; Wallin & Kronvall, 2002). As suggested by Holtom-Visel and Allan's (2014) systematic review, these noteworthy but still unresolved family issues have to be elucidated by further studies, including not only self-reported questionnaires, but also observational clinician-rated procedures.

Key Practitioner Message

- Patients with more severe anorexia experiment more difficulties in triadic interactions.
- Therapeutic approaches to severe adolescent anorexia nervosa should include the paternal participation as well as the maternal one.
- A better adolescent functioning in the triadic mother–father–daughter relationships is associated with a better outcome.

Given this scenario, it is not surprising that well-known authors, as Herpertz-Dahlmann, Seitz, and Konrad (2011), claim that anorexia is a predominantly neuropsychiatric disorder in its pathogenesis, with nothing to do with the model of the psychosomatic family, characterized by an overinvolved and rigid interpersonal style that prevents individuals from the free expression of emotions, particularly the negative ones (Minuchin et al., 1978). It is indeed clear that, in such a complex psychopathology as anorexia nervosa, absolute and sharp assumptions about the causal role of the family can neither be acceptable nor well-founded, ignoring the whole, complex set of vulnerability, biological and environmental factors that are necessary for the establishment of an eating disorder (Polivy & Herman, 2002). Moreover, certain conclusions on the causal—or rather secondary (consequent)—role of family dysfunctions in relation to eating disorders are not currently tenable because of the cross-sectional design that characterizes most research studies in this field (Jack, 2001; Treasure et al., 2008). The Academy of Eating Disorders (Le Grange, Lock, Loeb, & Nicholls, 2010) has taken a clear and strong position about the family issue, declaring to be "against any aetiologic model of eating disorders in which family influences are seen as the primary cause of anorexia nervosa or bulimia nervosa" (Le Grange et al., 2010, p. 1). Therefore, if past research mainly focused on the causal aetiopathogenetic role of family dynamics on eating disorders, more recent literature tends to explore the role of family functioning in the maintenance of the disorder or, conversely, in the facilitation in the recovery process (Holtom-Viesel & Allan, 2014).

In line with these premises, a recent study (Balottin, Mannarini, Mensi, Chiappedi, & Gatta, 2017), conducted with a standardized observational tool based on a recorded play session, the Lausanne Trilogue Play (LTP; Fivaz-Depeursinge & Corboz-Warnery, 1999), by now widely applied in international literature but still underused in the case of adolescent psychopathology, showed the specific relational patterns present in the families of patients with anorexia nervosa, comparing them with families of adolescent daughter suffering from emotional disorders (anxiety and depression). The LTP consists of 15 min of family play: during the procedure the parents are asked to interact with their daughters in four different phases, allowing the direct observation of family dynamics and therefore paving the way to the possibility of therapeutic work based on them. Daughters with anorexia nervosa and their mothers and fathers showed during the play marked difficulties in respecting their roles, in maintaining the joint focal attention, and finally in sharing emotions and affects, especially in the triadic interactions that simultaneously include the mother and the father (third phase of the play). Moreover, during the couple's phase (fourth phase), parents struggle to carve out a couple-specific interactive space (Mannarini, Balottin, Munari, & Gatta, 2016), from which the daughter hardly bears being excluded.

Starting from the specificities found in the families of adolescents with anorexia, this study aims to establish a potential correlation between the specific relational patterns of the patients' families, measured by the LTP, and the clinical outcome of the adolescent's disorder, following a 6-month therapy period. This may contribute to the definition of more specific family dynamics correlated with the sensitivity to treatment and therefore with a more favourable outcome.

Based on the previous scientific literature on family relationships, we hypothesized to find a relationship between more severe clinical condition at the first assessment of patients with anorexia and deeper family dysfunctional dynamics.

We also assed the change (outcome) after a 6-month treatment. This outcome was hypothesized to be related to

- the adolescent's interactive ability in sustaining a triadic interaction with both the mother and the father and in letting the parents interact with each other,
- the whole family triadic ability to maintain a functional interaction during the play, and in particular during the last two phases.

2 | MATERIALS AND METHODS

2.1 | Participants

Seventy-two adolescents and parents, belonging to 24 families of patients with anorexia nervosa, participated in the study. The adolescents had been referred consecutively (from June 2016 to January 2017) to the Child and Adolescent Neuropsychiatry Unit, National Neurological Institute IRCCS C. Mondino—University of Pavia (Italy), a university tertiary care service, where the most impaired patients with anorexia are welcomed and also managed as outpatients before and after hospitalization.

Selection was based on the following inclusion criteria: diagnosis of anorexia nervosa, restrictive subtype, according to the DSM-5 (American Psychiatric Association [APA], 2013); current BMI below the 10th percentile per age and sex; age between 13 and 18; female gender. Exclusion criteria included instead: diagnoses of autism spectrum disorder, schizophrenia, learning disabilities (according to DSM-5); having received psychotherapy for a significant period (3 months or more); being from single-parent families; too limited understanding of the Italian language.

The mean age of the adolescent patients with anorexia was 14.83 years (standard deviation = 1.63; range 13 to18 years). Their mean BMI at the time of the first assessment was 14.95 (standard deviation = 1.69) and the mean duration of the illness before the time of the assessment was 10.12 months (standard deviation = 7.93). Seventy-nine percent of patients had co-morbid diagnoses. The additional co-morbid diagnoses were major depressive disorder (seven patients), persistent depressive disorder (eight patients), separation anxiety disorder (three patients), generalized anxiety disorder (two patients), social anxiety disorder (two patients), and obsessive–compulsive disorder (one patient). The fathers' mean age was 50 years (standard deviation = 6.32; range 36 to 64 years), whereas the mothers' mean age was 47.05 years (standard deviation = 5.47; range 36 to 57 years).

2.2 | Procedure

Child and adolescent psychiatrists and clinical psychologists, not directly involved in the research project, recruited the patients and their parents. All participants gave their written informed consent to

participation in the study, within a project authorized by the Ethical Committee of the area 17, University of Padua (Protocol 2339). The study was conducted in accordance with the national and institutional code of good ethical practice.

A neuropsychiatrist with special interest and clinical experience in anorexia evaluated all patients and collected a comprehensive medical and family history. Patients, diagnosed according to the DSM-5 criteria for restricting type anorexia nervosa (APA, 2013), also completed the Eating Disorder Inventory (EDI-3; Garner, 2004). The diagnosis of co-morbid disorders was supported by the Kiddie-SADS semistructured interview (Kaufman, Birmaher, Brent, Ryan, & Rao, 2000).

The families participated in a videotaped play session according to the LTP procedure, before the treatment. Two specifically trained judges, blind to the results of the other tests, scored the procedure. The MROAS was used at baseline and at 6 months follow up in order to evaluate the change (outcome) of the patient.

2.3 | Treatment

The treatment applied consisted of the following elements:

1. Neuropsychiatric monitoring, possible pharmacological therapy based on the symptoms associated with the eating disorder (e.g., depression or anxiety), nutritional counselling.
2. Individual psychodynamic psychotherapy once a week—based on the adolescent-focused therapy, manualized focused psychodynamic therapy, whose efficacy has been documented in the treatment of anorexia (Fitzpatrick, Moye, Hoste, Lock, & le Grange, 2010).
3. Parental counselling and support (fortnightly). Based on the model by Godart et al. (2012), the work with parents focused on current and past intrafamily dynamics, aiming at establishing a therapeutic alliance, helping parents to identify areas of personal responsibility and clarify the boundaries between generations, promote the ability to protect, contain and support family, allow the expression of conflicts and their constructive management, rediscover parental resources and strengths, restore a collective feeling of family identity, and foster the adolescent patient's autonomy. Each session was conducted with the parental couple or in the presence of mother, father, and daughter, according to the clinician's choice.

2.4 | Measures

2.4.1 | The Morgan–Russell Outcome Assessment Schedule

The MROAS is an observational clinical evaluation (Morgan & Hayward, 1988), adapted to the adolescent age by Jeammet et al. (1991). The scale identifies 10 items that allow the clinician to describe the evolution of young patients with anorexia nervosa, based on feeding, weight, menstruation, mental state, insight, intimate–sexual relations, family relationships, social contacts outside the family, employment (or school for adolescents), and potential addictive conducts. The MROAS in fact takes into account both biological and physical aspects—such as BMI and the presence/absence of menstrual cycles—and psychopathological aspects—such as interpersonal relationships and insight. Scores lower than or equal to 20 correspond to a satisfactory global state, higher scores indicate intermediate ($20 < \text{score} < 28$) and bad (score > 27) conditions, the most unsatisfactory state corresponding to the total maximum score of 40.

2.4.2 | The Lausanne Trilogue Play

The LTP is a standardized observational procedure aimed at studying the triad as a whole as well as the organization of its parts (Fivaz-Depeursinge & Corboz-Warnery, 1999). The observational tool based on a videotaped, semistructured play, which takes approximately 15 min and requires the co-construction of a narrative on the topic of separation with the contributions of each member of the triad, following some rules (given as indications). Parents are asked to interact with their adolescent daughter in four different phases, with the aim to organize a weekend, in which the daughter will remain home on her own. In the first phase, one parent is asked to interact with the adolescent, whereas in the second parent, he simply remains nearby. In this second phase, the other parent is asked to interact with the adolescent, whereas the parent who played first is no longer directly involved. In the third phase (three-together phase), parents are asked to interact together with the daughter as a triad. In the fourth and last phase, parents are asked to continue to interact with each other, while the daughter should not to be directly involved.

The first two phases, the two-plus-one phases, allow to observe the dyadic dynamics between the mother and the daughter or between the father and the daughter, in the presence of the other parent; the third-phase (three-together phase) and the fourth phase (parental couple's phase) allow a more in depth assessment of the co-parenting and of the adolescent's and parents' ability to triangulate and simultaneously include all participants in the interaction. The narrative of a situation based on separation and autonomy, proposed in this study as the theme of the triadic play, may offer useful clinical indications; in particular, the way the triad shares the construction of the narrative allows to code the family interactions according to four different functional levels (participation, organization, focal attention, and affective contact). Participation, which represents the simplest function to be achieved and the first step to establish a collaboration, is the ability to get involved in the same interactive space, getting in touch with the other family members (McHale, Kuersten Hogan, & Lauretti, 2001). The organization of the roles is the capacity of each participant to play a role coherent with the subsystem to which he/she belongs (parental couple vs. offspring) and with the different parts of the play. The focal attention is the ability to reach and maintain a joint attentional focus, shared by the triad during the play; it allows to communicate meanings and affections and to co-construct a common narrative plot during the whole play. A functional focal attention is achieved when each of the participants pays attention to the interactive elements, to the ongoing activities, and to the actions of the other participants, sharing meanings with each other by mean of looks, gestures, and words. The affective contact is the more complex functional level, which implies the emotional sharing, the reciprocity, and

communion of affections (McHale et al., 2001). It is evaluated observing the affective tone shown by the ways of looking, physical contact, potential reinforcements, and verbal communications of affects within the triad.

The coding system of the LTP used herein (Malagoli Togliatti & Mazzoni, 2006) comprises four scales (participation, organization, focal attention, and affective contact), each defining an observational variable measured for each individual and for each phase and graded on a 3-point Likert scale (0 = *dysfunctional*, 1 = *partially functional*; 2 = *functional*). This coding scheme provides a score for each family member (daughter, mother, and father) and for each functional level (participation, organization, focal attention, and affective contact) in each part of the play, and a global score of the family functioning. Two different raters were required to define the presence or absence of the specific behavioural indicators necessary to assign the score to each functional level. In cases of disagreement in attributing the score, an agreement score was reached through discussion with an expert judge. The inter-rater reliability between the two assessors was calculated for every single score, using Cohen's K coefficient. The reliability estimates were higher than the recommended threshold of k = 0.60 and ranged from 0.63 to 1.

2.5 | Analyses

According to the aim of the study, the hypotheses were operationalized and the MROAS and LTP data were analysed according to the following steps:

Step 1.

Hypotheses

- A majority of adolescents should score in the range corresponding to a very unsatisfactory psychopathologic evaluation measured by the MROAS at the baseline (Time 1).
- At the baseline (Time 1), significant relations should emerge between the unsatisfactory psychopathologic evaluation of the adolescents and dysfunctional adolescent/family interactions as measured by the LTP in the different phases and at the different functional levels.

In order to define the location of each participant on the psychopathological dimension at the first MROAS application (Time 1), a Many Facet Rasch Model (MFRM) analysis (Linacre, 2005) was applied. It allowed the simultaneous parameterization of the participants (Facet 1) and of the items (Facet 2) on the dimension. Rasch models have a long tradition in health and clinical psychology (e.g., Mannarini, 2009; Mannarini & Boffo, 2014; Mannarini, Boffo, Bertucci, Andrisani, & Ambrosini, 2013; Mannarini, Reikher, Shani, & Shani-Zinovich, 2017).

The model used herein allowed also the parameterization of specific attributes of the participants, such as, in this study, the adolescent/family interactive abilities as measured by the LTP (Facet 3). To enter the LTP parameter into the model, the LTP interactive ability scores were categorized into three levels: *dysfunctional* (0), *partially functional* (1), and *functional* (2). The MFRM also provided an analysis of the relation between the adolescent psychopathological evaluation (MROAS) and the adolescent/family interactive ability as measured by the LTP in the different phases and at the different functional levels (participation, organization, focal attention, and affective contact). The MFRM analysis was performed using the FACETS 3.60.0 computer program (Linacre, 2005).

Step 2.

Hypothesis

- A comparison between the MROAS evaluations at the baseline (Time 1) and the MROAS evaluations after 6 months (Time 2) should evidence a significant positive change (outcome) in the adolescents' psychopathological degree, both from a global point of view and for each single adolescent.

In order to verify a possible change in the adolescents' psychopathological evaluations, at the time of the second MROAS application, after 6 months of treatment (Time 2), a new MFRM analysis (Rasch, 1960; Linacre, 2005) was performed. Besides the participants' and items' parameters, a time parameter was introduced in the model in order to compare the adolescents' psychopathological evaluation at Time 1 versus Time 2.

The Rasch analysis also allowed to compare the psychopathological evaluation of each single adolescent measured at both times. This comparison, based on the Student *t* analysis, allowed to evidence the presence of significant improvement or lack of improvement for each adolescent (improvement yes/no).

Step 3.

Hypothesis

- The association between different levels of improvement (outcome), as measured by the MROAS at Time 1 versus Time 2 with different levels of the adolescent/family interaction ability as measured by the LTP, should evidence a positive association of a functional adolescent/family interaction at the baseline (Time 1) with a significant improvement after 6 months of treatment (Time 2). In other words, it was hypothesized that a good interaction among family members should facilitate an improvement in the adolescents' psychopathology.

In order to analyse the association between different outcomes (improvement yes/no) as obtained after comparing the MROAS at Time 1 versus Time 2 and different levels of the adolescent/family interactive ability measured by the LTP, log-linear analyses were performed separately for adolescents and families. In order to do so, 2 × 2 tables were created where two categories were defined based on the outcomes obtained by the comparison of the MROAS at Time 1 versus Time 2: the two categories were named improvement yes/no. Two categories were also defined for the LTP interactive scores, named *dysfunctional* (0) and *functional* (1) categories (zero including also the partially dysfunctional cases). Adolescents and families were classified into such categories separately and then cross-classified to create the 2 × 2 tables. The log-linear analysis allowed to estimate a parameter for each cell of the tables, which represents the strength of the association between the MROAS outcomes and the LTP interactive functioning.

3 | RESULTS

3.1 | Description of the patients at the baseline and after 6 months of treatment

The mean BMI, which was 14.95 (standard deviation = 1.69) at the time of the first assessment, grew to 17.07 (standard deviation = 2.15) after 6 months of treatment. The mean MROAS score at first assessment was 28.25 (standard deviation = 4.19) and it improved to 23.33 (standard deviation = 6.74) after 6 months. At the time of the first assessment, 75% of patients had a very unsatisfactory state (score > 27) according to the MROAS, whereas 21% had an intermediate state (20 < score < 28) and only 4% had a quite satisfactory global state (score < 21). Six months after, only 25% of the same patients had an unsatisfactory state, 54% had an intermediate state, and 21% had a satisfactory one.

3.2 | Step 1—The baseline: MROAS evaluation and interactive ability at Time 1

Table 1 shows the estimated parameters distributed on the psychopathologic dimension (based on the MROAS evaluation) obtained for each participant with the MFRM (Time 1). The mean value is 0.31 (standard error 0.10). The parameters range between −3.41 and 3.91; 79.17% are positive values confirming that the majority of the participants are in an unsatisfactory state at the baseline assessment.

Table 2 shows the significant results of the analysis of the relation between the adolescents' psychopathological evaluation (MROAS at Time 1) and their interactive ability measured by the LTP in the different phases.

The quality of the adolescent's functioning measured by the MROAS was positively related to the adolescent's interactive ability in respecting the organization of the roles in the third and fourth phases; this means that a better psychopathological evaluation was associated with a higher level of adolescent's interactive ability and a poorer psychopathological evaluation to a lower level of respecting roles. Moreover, the adolescent's psychopathological evaluation appeared to be positively related also to the ability in maintaining the focal attention on the task during the parental couple's phase (the fourth), whereas it was negatively related to the focal attention exhibited during the second dyadic phase. In other words, differently from what happened in the third and fourth phases, the adolescents who displayed a better focal attention (receiving a highest score) during this dyadic interaction displayed poorer clinical conditions and functioning when evaluated using the MROAS.

Table 3 shows the significant results of the analysis of the relation between the adolescent psychopathological evaluation (MROAS) and the family interactive ability measured by the LTP in the different phases.

Interactions were found for what concerns the participation, organization, and affective contact functional levels. Surprisingly, the more severe adolescent psychopathology (and therefore the worse clinical evaluations at MROAS) was associated with higher levels of familial organization and affective contact in the second dyadic phase and in the third phase of the LTP.

TABLE 1 Adolescents' psychopathological evaluations (baseline and after 6 months) and outcome

Adolescent	Time 1	SE	Time 2	SE	Student *t*
1	1.14	0.58	−0.85	0.47	2.67*
2	0.82	0.57	−1.57	0.51	3.12*
3	0.82	0.57	−0.22	0.45	1.43
4	2.18	0.61	−1.08	0.48	4.20*
5	2.56	0.63	1.78	0.53	0.95
6	−0.69	0.55	0.81	0.47	−2.07*
7	1.14	0.58	1.03	0.48	0.15
8	−0.99	0.55	−1.31	0.5	0.43
9	1.14	0.58	−0.22	0.45	1.85*
10	1.14	0.58	−0.63	0.46	2.39*
11	1.14	0.58	−0.63	0.46	2.39*
12	0.82	0.57	−0.42	0.46	1.69*
13	−3.41	0.66	0.39	0.45	−4.76*
14	2.56	0.63	0.39	0.45	2.80*
15	1.82	0.6	0.39	0.45	1.91*
16	1.48	0.59	−0.85	0.47	3.09*
17	−0.1	0.55	−2.13	0.56	2.59*
18	1.82	0.6	0.39	0.45	1.91*
19	3.91	0.73	2.42	0.6	1.58
20	1.14	0.58	0.19	0.45	1.29
21	0.82	0.57	−1.84	0.53	3.42*
22	0.82	0.57	1.26	0.49	−0.59
23	−0.1	0.55	−0.42	0.46	0.45
24	0.82	0.57	1.03	0.48	−0.28

Note. Time 1/2: Many Facet Rasch Model estimated parameters of adolescents' psychopathological evaluation (Morgan–Russell Outcome Assessment Schedule) at the baseline (Time 1) and after the 6-month treatment (Time 2); SE: standard errors; Student *t*: statistic to evaluate the change (outcome) from Time 1 to Time 2.

*$p < 0.05$.

3.3 | Step 2—The outcome: comparison of the MROAS estimated parameters at Time 1 versus Time 2

In general, a significant improvement was noticed after 6 months of treatment, the psychopathological estimated parameter being 0.31 (SE = 0.10) at Time 1 and −0.39 (SE = 0.09) at Time 2 ($\chi^2 = 33.1$, $df = 1$, $p = 0.001$). Table 1 shows the single participant estimates at both Time 1 and Time 2, together with the results obtained by means of the Student *t* analysis (Time 1 vs. Time 2). The results show a large number of improved cases (83.3% of the adolescents), the 54.17% being statistically significant.

3.4 | Step 3—Association between adolescents' outcome (MROAS) and adolescent/family interactive ability (LTP)

Table 4 shows the significant results of the log-linear analyses concerning the adolescent interactive abilities. Associations between outcome (improvement yes/no) measured by the MROAS (Time 1 vs. Time 2) and different levels of the adolescent interactive ability (measured by the LTP) are shown.

TABLE 2 Adolescents' interactive ability and psychopathological evaluation at the baseline

LTP phases	LTP functional levels	Adolescent LTP categories	MROAS estimated parameters	SE	*df*	χ^2
Phase II	Focal attention	0	−0.61	0.17	1	24.2**
		1	--	--		
		2	0.61	0.17		
Phase III	Organization	0	0.44	0.26	2	7.1*
		1	−0.01	0.18		
		2	−0.44	0.21		
Phase IV	Organization	0	0.35	0.17	2	11.3**
		1	0.26	0.25		
		2	−0.61	0.35		
	Focal attention	0	1.18	0.23	2	38.2**
		1	−0.14	0.18		
		2	−1.03	0.30		

Note. Adolescent LTP categories: *dysfunctional* (0)/*partially dysfunctional* (1)/*functional* (2) adolescent interactive ability; MROAS estimated parameters: Many Facet Rasch Model estimated parameters of the adolescents' psychopathological functioning at the baseline (Time 1); SE: standard errors; *df*: degrees of freedom; LTP: Lausanne Trilogue Play; MROAS: Morgan–Russell Outcome Assessment Schedule; --: No subjects received that score and therefore no MROAS estimated parameter could be calculated.

*$p < 0.05$. **$p < 0.01$.

TABLE 3 Family interactive ability and adolescents' psychopathological evaluation at the baseline

LTP phases	LTP functional levels	Family LTP categories	MROAS estimated parameters	SE	*df*	χ^2
Phase I	Organization	0	0.35	0.41	2	14.4**
		1	0.47	0.14		
		2	−0.82	0.31		
Phase II	Organization	0	−1.24	0.56	2	12.6**
		1	0.15	0.13		
		2	1.09	0.37		
	Participation	0	−0.33	0.14	1	5.3*
		1	--	--		
		2	0.33	0.25		
Phase III	Affective contact	0	−0.56	0.32	2	5.2*
		1	0.23	0.13		
		2	0.33	0.58		

Note. Family LTP categories: *dysfunctional* (0)/*partially dysfunctional* (1)/*functional* (2) family interactive ability; MROAS estimated parameters: Many Facet Rasch Model estimated parameters of the adolescents' psychopathological functioning at the baseline (Time 1); SE: standard errors; *df*: degrees of freedom; LTP: Lausanne Trilogue Play; MROAS: Morgan–Russell Outcome Assessment Schedule; --: No subjects received that score and therefore no MROAS estimated parameter could be calculated.

*$p < 0.05$. **$p < 0.01$.

Considering the different levels of interactive abilities measured by the LTP in relation to the different outcomes of the patients (categories of improved vs. nonimproved patients), adolescents with better interactive abilities in participation (fourth phase) and focal attention (first and second phases) seemed to more often have a good outcome, whereas patients with worse interactive capacities at first assessment seem to have not improved their clinical conditions after 6 months of treatment.

Table 5 shows the significant results of the log-linear analyses concerning the family interactive ability.

Considering the different levels of family interactive abilities measured by the LTP in relation to the different outcomes of the patients, adolescents belonging to families with better interactive abilities in the triadic phase (focal attention, third phase) more often showed a good outcome after the 6-month treatment. However, improved patients more often belonged to families more dysfunctional in the dyadic phases (first and second), in particular, for what concerns the organization of the roles and the focal attention in the first phase and the participation in the second phase. Vice versa patients classified as not improved more often belonged to families resulting more functional in the dyadic phases at the time of the first assessment.

TABLE 4 Association between adolescents' outcome and interactive ability: log-linear standardized estimated parameters

LTP phases	LTP functional levels	Adolescent LTP categories	Improvement	
			Yes	No
Phase I	Focal attention	0	−1.41*	1.41*
		1	1.41*	−1.41*
Phase II	Focal Attention	0	−1.64**	1.64**
		1	1.64**	−1.64**
Phase IV	Participation	0	−1.54*	1.54*
		1	1.54*	−1.54*

Note. Improvement yes/no: adolescent outcome (evaluated with Morgan–Russell Outcome Assessment Schedule—Time 2 vs. Time 1); Adolescent LTP categories: *dysfunctional* (0) /*functional* (1) adolescents' interactive ability; LTP: Lausanne Trilogue Play.

*$0.05 < p < 0.07$. **$p < 0.05$.

TABLE 5 Association between adolescents' outcome and family interactive ability: log-linear standardized estimated parameters

LTP phases	LTP functional levels	Family LTP categories	Improvement	
			Yes	No
Phase I	Organization	0	1.55*	−1.55*
		1	−1.55*	1.55*
	Focal attention	0	1.81**	−1.81**
		1	−1.81**	1.81**
Phase II	Participation	0	1.78**	−1.78**
		1	−1.78**	1.78**
Phase III	Focal attention	0	−1.65**	1.65**
		1	1.65**	−1.65**

Note. Improvement yes/no: adolescent outcome (evaluated with Morgan–Russell Outcome Assessment Schedule—Time 2 vs. Time 1); Family LTP categories: *dysfunctional* (0) /*functional* (1) family interactive ability; LTP: Lausanne Trilogue Play.

*$0.05 < p < 0.07$. **$p < 0.05$.

4 | DISCUSSION

Based on data obtained with the standardized observational procedure (LTP), the severity of the clinical presentation of anorexia at first assessment seemed to be related to lower interactive abilities on the adolescent's part, with the only exception of the focal attention in the second phase. In particular, a more severe anorexia seemed connected in our adolescents to a specific difficulty in respecting their own role (organization functional level) while interacting with the parents in the three-together as well as in the parental phases (third and

fourth phases). Adolescents presenting with a more compromised personal functioning seemed to prefer dyadic interactions with one parent at a time also when the mother–father–daughter triad was asked to play together (as in the third phase). Moreover, these adolescents were not able to let the parents interact with each other (as requested in the fourth phase), becoming instead frequently involved in the interaction. In these cases, the daughter behaved as if she was assigned the responsibility of controlling the relationship between the parents and therefore she paid less attention to the task assigned (low focal attention). We can hypothesize that these interactive difficulties on the girl's part could be the consequence of a more severe psychopathological disorder in the adolescent development. This is in line with the view of some authors (Brusset, 2004; Jeammet, 2010), who consider anorexia nervosa as a disease of adolescence, whose onset is associated with a difficulty in overcoming the typical conflicts of the adolescent age. As an alternative, we could also hypothesize that a more severe anorexia might imply specific relational difficulties as a consequence of the disease and of the resulting physical and cognitive impairments. This hypothesis seems, however, less plausible because, according to our data, patients with a more impaired MROAS score not always had a lower BMI. Moreover, adolescents with more severe anorexia showed impairments in the specific interactive patterns connected to the triadic functioning while they did not show more difficulties in the dyadic phases.

Differently from what was hypothesized, worse family interactions were not connected to a more severe clinical presentation at first assessment. On the opposite, families of adolescents with more severe psychopathological conditions (based on the MROAS) frequently exhibited a good functioning in the dyadic interactions, which corresponds to the first (mother–daughter) and second (father–daughter) phases of play. This could mean that dyadic interactions are more characteristics of an infantile and calmer style of relationship with parents on the adolescent patient's part; the adolescent's personal ability to cope with a more complex triadic relation, simultaneously including mother and father, was a better predictor of a lower severity of the psychopathology, compared with the general family functioning.

Adolescents who showed better personal interactive abilities had a better outcome. Patients in fact showed in general a good outcome: although 75% of the patients had an unsatisfactory score at the initial global Morgan-Russel assessment, only 25% scored unsatisfactory after 6 months of treatment. A good outcome was specifically associated with a better participation (fourth phase) and focal attention (first and second phases) on the adolescent's part, along with a high family focal attention in the third phase.

Overall, family interactive abilities during the dyadic phases—in particular, participation in the second phase, organization and focal attention in the first phase—were inversely related to the adolescent outcome. The general family interactive functioning and the parents' interactive abilities seemed therefore not to be directly linked to the girl's clinical situation nor to the outcome. However, a dyadic peaceful interaction between one parent and the daughter might sometimes be interpreted as a sign of the apparent serenity of a symbiotic relationship, where the aggressiveness may be denied or cut off and cannot be used by the daughter to organize her adolescent individuation process (Balottin, Mannarini, Rossi, Rossi, & Balottin, 2017; Jeammet, 2010; Russell, Kopec-Schrader, Rey, & Beumont, 1992). This hypothesis is in line with the finding of a decreased quality of the interaction in the triadic phase, when families of daughters with anorexia were required to display a greater triangular coordination (Balottin, Mannarini, Mensi, et al., 2017). In line with these findings, this study showed that, differently from what happens in the dyadic phases, the adolescent's specific difficulties in the triadic interactions, as well as the impossibility to carve out a parental couple-specific relational space on the parents' part, appeared connected to the severity of the clinical presentation of adolescent anorexia.

This study seemed therefore to identify a rather specific clinical relational picture corresponding to marked overall severity of the psychopathology of the adolescent daughter, opening different potential clinical implications. It was characterized by girl's elective difficulties in the triadic interactions and on the other hand by a good family ability in dyadic interactions. This latter finding, which is potentially difficult to read at a clinical level, opens up more questions rather than providing answers. At least for what concerns these most serious forms of anorexia nervosa, we can hypothesize the presence of an individual psychopathology, which is not originally nor exclusively familiar. In these cases, the difficulties in the family relationship emerge almost exclusively at a triadic level, while they might remain substantially denied and hidden in the dyadic interaction, due to a potential regressive tendency to an infantile dependent attachment and dyadic fusion movement (Brusset, 2004; Zachrisson & Skårderud, 2010). This hypothesis remains to be confirmed by further studies. However, according to the present results, it seems very likely that identifying specific triadic difficulties in family relationships on the girl's side may indicate the presence of a serious psychopathology and suggest the need for an intensive and targeted treatment in the context of a more severe clinical and psychopathological condition of anorexia.

Conflicts within the mother–daughter dyadic relationship in adolescence (and therefore low dyadic scores in the LTP evaluation) may indicate, paradoxically, a greater psychological mobility and therefore the adolescent's ability to benefit faster from both an individual and a family therapy, addressing also to the adolescent issues of autonomy within family relationships (Godart et al., 2012). In these cases, the correlation between a good outcome and an individual girl's good functioning in family relationships, more so in the triadic interactions, can identify a specific positive prognostic factor.

This study has some limitations, which imply caution in interpreting and generalizing the results obtained, due to the restricted sample of patients and parents included, to the specific clinical context of research (i.e., a university tertiary care service, where the most impaired patients with anorexia are welcomed and managed before and after hospitalization). Moreover, clinical implications concerning the connection between family relations and outcome were deducted from a family assessment conducted during the first moments of the evaluation and diagnosis; future

studies will also need to evaluate if a more prolonged follow-up of the family interactions and of their modifications, after a longer period of therapy, would be additionally related to the quality of the patient's outcome.

4.1 | Clinical implications and conclusions

The results of our family interactions assessment (LTP) prior to therapy strongly related to the outcome of the patients, evaluated with the MROAS after a 6-month treatment period, showing primarily that

1. The severity of clinical presentation at first observation was associated with a significant and prevalent disorder on the girl's part in establishing positive interactions with her mother and her father, in particular, in triadic interactions. The clinical severity, however, did not relate significantly with parallel relational difficulties on the parents' part: at first assessment, they showed good interactive capacity, at least as regards the dyadic relationship with the girl (first and second phases of the play).
2. As to the outcome, the adolescent's improvement was significantly associated with her better functioning in family relationships, evaluated at first assessment, both in terms of dyadic and triadic interactions. Concerning the quality of the whole family relationships, clinical improvement seemed associated with previous difficulties in dyadic relations with the adolescent girl on the mother's and the father's part, which indeed contrast with a good triadic interaction.

   Despite the complexity of the results obtained, some of the aspects found in the relationship between family functioning and anorexic course and sensitivity to therapy can be clarifying.

Data concerning the relation between the severity of the disorder and the family relationships suggest that the overall severity of the adolescent disorder can be associated with an elective difficulty in triadic interpersonal interactions, which means a specific difficulty in overcoming the most infantile developmental phases (dyadic vs. triadic relationship) and achieving a rich and flexible ability to interact with others. It is worth noting, however, that there are no parallel difficulties in the relationship on the two parents' part.

Much more complex appears the relationship between family interactions and girl's improvement on the MROAS, which correlates with the presence in the adolescent girl of good relational ability within the family and in particular good triadic interpersonal skills. In addition, the parents' ability to positively interact within a triadic relationship seems to correlate with a positive prognosis and a better sensitivity to treatment.

This study overall shows how triadic relational abilities exhibited by the adolescent girl within the family associate with a positive prognosis and a greater sensitivity to therapy. It is worth hypothesizing therefore that, among family relational factors, the very issue of the triadic relational ability of the adolescent may present the highest value in characterizing the patients' profile and prognosis. It is likely that these patients could more deeply benefit from a family therapeutic approach, such as the French FT (Godart et al., 2012); in these cases, in fact, the adolescent's conflict with the mother and the father appeared since the first assessment to be overt and therefore could benefit from the clinicians' help to the parents in facing and managing it. We can also suppose that these adolescents suffer from a less serious psychopathological condition, because from the beginning of the treatment, they showed better triadic interactive and relational abilities, which may be linked to a more positive perception of autonomy and separation, although sometimes conflictual, from the parents (Brusset, 2004; Jeammet, 2010; Russell et al., 1992). According to recent studies on family functioning and adolescent anorexia (Balottin, Mannarini, Mensi, et al., 2017; Wallis, Miskovic-Wheatley, et al., 2017), a decline in the mother–daughter and father–daughter relationship quality may just reflect a physiological adolescent autonomy process. Accordingly, the main guidelines for the management of eating disorders (APA, 2006; Espie & Eisler, 2015; Hay et al., 2014; Herpertz-Dahlmann et al., 2015; Lock et al., 2015; NICE, 2017), support family therapy as the first line treatment, especially in the case of less sever and younger patients with a recent onset of anorexia.

On the contrary, we can suppose that patients with a more sever psychopathological condition would benefit from a supplementary individual treatment (such as adolescent-focused therapy in addition to the family therapy), addressing directly and precociously adolescent autonomy issues, which seemed in these cases more problematic. These latter patients in fact showed less conflictual dyadic interactions with parents, although triadic interactions were the most deficient and problematic. Reinstate a physiological adolescent development trajectory would be in these cases more difficult but it can be considered a pivotal aim to be targeted in the recovery process, because severe anorexia and more marked psychiatric problems appeared to be closely linked (Ciao et al., 2015; Wallis, Miskovic-Wheatley, et al., 2017). We believe that such a goal can be more easily achieved using both an individual approach to support the adolescent and a family or parental one, in order to help parents in accepting and enhancing the adolescent's changes as well as in tackling the eventual premorbid family and parental issues, which may have prevented those changes (Godart et al., 2012; Wallis, Miskovic-Wheatley, et al., 2017). A growing body of literature indeed indicates that therapeutic approaches to severe adolescent anorexia nervosa should include the paternal participation (Couturier et al., 2013; Horesh, Sommerfeld, Wolf, Zubery, & Zalsman, 2015; Jones et al., 2006), as well as the maternal one, in the treatment of the adolescent, thus favouring the parental alliance and the triadic interactions.

Subsequent more comprehensive researches will help examining if the LTP can actually support clinicians in more specifically identifying the intrafamily characteristics, such as the triadic abilities of the daughter, that need to be targeted by the treatment in order to increase the chance of gaining a good outcome for the young patient with anorexia.

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CONFLICT OF INTEREST STATEMENT

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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