

Université de Montréal

**A Study of the Behavioural and Affective Profile of
Inpatient Adolescent Girls Presenting a Restrictive
Anorexia Nervosa**

par

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Essai doctoral d'intégration présenté à la Faculté des Études Supérieures et Postdoctorales
en vue de l'obtention du grade de Psychologiae Doctor (D.Psy)
en Psychologie Clinique
Option clinique

Avril, 2016

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Résumé

Les troubles du comportement alimentaires (TCA) sont reconnus comme le troisième problème de santé chronique le plus fréquent chez les adolescents (Herpertz-Dahlmann, 2015; Rosen, 2003). L'évolution du trouble peut être assez variable d'un individu à l'autre, mais le pronostic semble meilleur lorsqu'il apparaît à l'adolescence (Steinhausen, 2002; 2009). L'étude des difficultés propres aux adolescentes présentant un TCA semble être une avenue intéressante pour approfondir nos connaissances concernant leur fonctionnement psychologique.

La présente étude poursuit trois objectifs. Elle vise à : (1) Décrire le profil des difficultés comportementales et affectives d'un groupe d'adolescentes hospitalisées pour une anorexie mentale de type restrictive (ANR); (2) Examiner la relation entre les problèmes comportementaux et affectifs à l'étude et l'intensité du trouble alimentaire; (3) Explorer le lien entre les difficultés mesurées et l'évolution pondérale pendant l'hospitalisation.

Le groupe à l'étude est composé de 52 adolescentes hospitalisées pour une ANR. Les difficultés comportementales et affectives ont été évaluées à l'aide du Youth Self Report, et l'intensité du trouble alimentaire a été appréciée à l'aide du Eating Disorder Risk Composite (EDRC). Un ratio entre l'Indice de Masse Corporelle (IMC) à l'admission et l'IMC à la fin de l'hospitalisation a été utilisé pour évaluer l'évolution pondérale des participantes.

Les résultats de l'étude montrent que le profil moyen de l'échantillon est majoritairement intériorisé, avec des difficultés qui diffèrent des normes au niveau des problèmes retirés/déprimés et anxieux/déprimés. Trois profils de difficultés spécifiques sont observés dans l'échantillon soit: (1) normatif, (2) difficultés intériorisées, (3) problèmes

intériorisés et extériorisés. Des corrélations positives significatives sont observées entre l'intensité du trouble mesurée par l'EDRC et les problèmes répertoriés. Une corrélation négative modérée est observée entre le gain de poids et l'intensité des difficultés extériorisées. Il semble donc y avoir un lien entre rapporter davantage de difficultés extériorisées et une plus faible prise de poids lors de l'hospitalisation pour cette population.

La prépondérance de difficultés intériorisées trouvées dans cette étude (particulièrement au niveau des problèmes liés à l'anxiété et la dépression) semble cohérente avec la littérature portant sur les principales comorbidités de ce trouble. Cette description permet également de constater une hétérogénéité dans les profils de fonctionnement trouvés pour cet échantillon par ailleurs assez homogène, mettant ainsi l'emphase sur l'importance d'une évaluation globale des jeunes hospitalisées pour une ANR et un traitement individualisé aux problématiques rapportées par chacune. En second lieu, la présence d'une relation positive entre l'intensité des difficultés comportementales et affectives intériorisées et externalisées et l'intensité du trouble alimentaire démontre que plus les symptômes associés à l'ANR sont importants, plus le fonctionnement global de l'adolescente sera affecté. Finalement, il est possible de se demander si certains types de traitement pourraient être plus bénéfiques à certains types de patients concernant le gain pondéral pendant l'hospitalisation.

Mots-clés : Anorexie restrictive, Adolescence, Youth Self Report, Problèmes comportementaux et affectifs, IMC

Abstract

Eating Disorders (ED) are recognized as the third most common chronic illness among adolescents (Herpertz-Dahlmann, 2015; Rosen, 2003). Evolution of ED is known to be heterogenous in between patients, but prognosis seems more favourable when the disorder appears at adolescence (Steinhausen, 2002; 2009). The study of individual difficulties seems like an interesting avenue to refine our understanding of the psychological functioning of those suffering from ED.

This study aimed to: (1) Describe the behavioural and affective profile of inpatient adolescent girls with a restricting type of Anorexia Nervosa (ANR) ; (2) Investigate the presence of a relationship between the behavioural and affective difficulties measured and the intensity of the disorder; (3) Examine the presence of a relationship between the individual problems and weight gain during inpatient treatment.

The sample consisted of 52 inpatient adolescent girls presenting an ANR. The Youth Self Report assessed the behavioural and affective difficulties, while the Eating Disorder Risk Composite was used as the indicator of the intensity of the disorder. A ratio between Body Mass Index (BMI) at admission and at the end of hospitalization was calculated to measure weight gain during treatment.

The sample was characterized by an average internalized profile of individual difficulties that reached the clinical threshold. Three different profiles of problems were found within the sample: (1) normative, (2) pure internalizing, (3) mixed (with difficulties that differed from norms on both the internalizing and externalizing clusters). Strong positive correlations were found between individual characteristics and intensity of the disorder,

whereas a moderate and negative association was found between weight gain and the externalizing features measured.

The internalized profile of difficulties found for the sample (particularly elevated for anxious and depressed problems) seems consistent with previous studies on comorbidities for adolescent ED. This description provides information on the heterogeneity of this specific population, which is otherwise quite similar, hence giving strength to the idea of a global assessment of the functioning of the adolescent at admission and an individualized form of treatment that takes into consideration the specific difficulties reported by the patient. Significant correlations were found between results on the YSR and on the EDRC which proposes that the more important the symptoms of the ANR are, the more affected the functioning of the adolescent will be for the emotional and behavioural problems measured. Finally, results show that girls presenting higher levels of externalized difficulties were those who gained less weight during treatment, which seems to demonstrate that certain treatment strategies could benefit more certain types of patients.

Keywords : Restrictive anorexia, Adolescence, Youth Self Report, Emotional and behavioural problems, BMI

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Liste des abréviations

| | |
|------|---|
| AN | Anorexia Nervosa |
| ANB | Anorexia Nervosa Binge-eating/purging type |
| ANR | Anorexia Nervosa Restricting type |
| BMI | Body Mass Index |
| ED | Eating Disorders |
| EDI | Eating Disorder Inventory 3 |
| EDRC | Eating Disorder Risk Composite Scale of the EDI 3 |
| YSR | Youth Self Report of the Achenbach System |

*À mes parents, Nicole et William, pour leur
aide précieuse et leur amour inconditionnel*

Remerciements

Je prends le temps de remercier plusieurs personnes sans qui la réalisation de ce projet aurait été difficile.

Tout d'abord, j'aimerais remercier ma directrice d'essai, Dominique Meilleur, pour ses conseils, son rationnel et ses encouragements tout au long de cette démarche. Merci pour toutes les heures de réflexion passées sur ce projet et merci de m'avoir conseillée et écoutée tout au long de ce cheminement.

Un merci spécial à mon amie Valérie Courchesne d'avoir toujours cru en moi, depuis le début du baccalauréat et de m'avoir donné la motivation de continuer au doctorat. Merci à Valérie et Marilena Côté-Lecaldare d'avoir toujours été disponibles pour lire ce projet et me donner commentaires et encouragements dans cette démarche.

Merci à tous mes proches qui ont toujours été là pour moi et qui m'ont permis de devenir la personne que je suis aujourd'hui. Je pense plus particulièrement à Sarah-Jeanne Dubé Mercure, Audrey Perreault, Frédéric Lanteigne, Mathieu Chartrand, Anne Kominik, Gabrielle Fallu, Fanny Guérin Lazure, Andréanne Juneau, Patricia Lafond, Gabrielle Larue, Émilie Faubert-Raymond, Béatrice Filion, Sarah Dagenais, Stéphanie Tassé et j'en passe. À tous ceux, de près ou de loin, qui ont été présents pour moi.

Finalement, merci à mes parents, Nicole Paquin Hodge et William Hodge pour leurs encouragements constants et leur présence tout au long de cette démarche.

Article

**A Study of the Behavioural and Affective Profile of Inpatient
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Titre abrégé: BEHAVIOURAL AND AFFECTIVE PROFILE OF INPATIENT
ADOLESCENT GIRLS WITH RESTRICTIVE ANOREXIA NERVOSA

A Study of the Behavioural and Affective Profile of Inpatient Adolescent
Girls Presenting a Restrictive Type of Anorexia Nervosa

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Cette recherche a reçu l'appui du Fond de Recherche Québécois en Sciences et Culture.

Abstract

As evolution of eating disorders in adolescence is heterogeneous, understanding better the individual differences in difficulties reported by this population seems like an interesting avenue to better understand their psychological functioning. This study aimed to: (1) Describe the behavioural and affective profile of difficulties of inpatient adolescent girls presenting a restricting type of anorexia (2) Investigate the presence of a relationship between the behavioural and affective problems and the intensity of the disorder (3) Examine the presence of a relationship between the behavioural and affective difficulties and weight gain during hospitalisation. The Youth Self Report assessed the behavioural and emotional profile of difficulties of the 52 participants while the Eating Disorder Risk Composite of the Eating Disorder Inventory (EDI-3) measured intensity of the disorder. A ratio between Body Mass Index at admission and at the end of treatment was calculated as an indicator of weight gain. The sample presented an average internalized profile of difficulties with scores that differed from norms for the withdrawn-depressed and anxious-depressed subscales. Three distinct profiles were found: normative, pure internalizing and mixed (clinical on the internalizing and externalizing clusters). Strong positive correlations were found between the behavioural and affective difficulties measured and intensity of the disorder, whereas results showed a moderate and negative association between weight gain and externalizing difficulties. This study provides information on the heterogeneity of this specific population otherwise quite similar and demonstrates how intensity of the disorder can be associated with a wide range of other behavioural and affective difficulties.

Keywords: Anorexia Nervosa, Restricting Type, Adolescence, YSR, Behavioral and Affective problems, Inpatient setting, Eating disorder

Behavioral and Affective Profile of Inpatient Adolescent Girls with Restrictive Anorexia Nervosa

Eating disorders (ED) are characterized by an alteration of eating behaviors and of the perception of body image (APA, 2013) that may lead to multiple deficits in psychological and physiological functioning (Agras, 2001; Gualandi, 2013; Mehler, Birmingham, Crow, & Jahrauz, 2010; Mitchell & Crow, 2006). The Diagnostic and Statistical Manual of Mental Disorder (DSM-5: APA, 2013) distinguishes between 4 principal types of ED: Anorexia Nervosa (AN), Bulimia, Binge Eating Disorder and Other Specified Feeding or Eating Disorder (OSFED; APA, 2013). AN is characterized by a persistent restriction of food intake, a disturbance of body image and an intense fear of gaining weight (APA, 2013). AN can be further distinguished in 2 subtypes: restricting AN (ANR) and binge-eating/ purging (ANB). The former refers to a type of AN where restriction of food intake and/ or excessive exercise are primarily used as a mean to lose weight, while the latter refers to a type of AN where episodes of binge eating or purging behaviors such as vomiting and laxative use (also called compensatory behaviors) are employed to control body weight (APA, 2013).

Research has demonstrated high rates of psychiatric comorbidities associated with ED, particularly anxiety disorders, mood disorders and personality disorders (Muratori, Viglione, Montalto, & Maestro, 2011; Steinhausen, 2002; Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011; Swinbourne et al., 2012; Wonderlich & Mitchell, 1997). Reviews of outcome studies showed an average mortality rate of about 5% for adults and adolescents with AN, with less than 50% having a full recovery, roughly 20% developing a chronic condition and approximately 33 % keeping residual symptoms (Steinhausen, 2002, 2009). These proportions are similar for people with bulimia, though prognosis is slightly better and mortality rates are lower (Steinhausen, 2009).

Compared to the adult population, the prevalence for ED is greater for adolescents: 0.5% for AN (compared to 0.3% for adults), 1 to 2% for Bulimia (compared to 0.9% for adults) and between 0.8 % to 14% for subclinical cases (compared to about 3.5% for adult women; Bravender et al., 2011; Chamay-Weber, Narring, & Michaud, 2005; Rosen, 2010; Smink, van Hoeken, & Hoek, 2012). These numbers appear to be increasing in recent years, putting ED as the third most common chronic illness among adolescents (Herpertz-Dahlmann, 2015; Rome et al., 2003; Rosen, 2003). Moreover, given the specific challenges associated with this developmental stage, ED in adolescence can be associated with an elevated risk of physiological and psychological difficulties (Johnson, Cohen, Kasen, & Brook, 2002; Story, Neumark-Sztainer, & French, 2002). Firstly, a state of malnutrition at this age can be linked to many medical consequences such as: disruption of brain development, developmental delay, alteration of the development of the endocrine and sexual systems and an increased risk for osteoporosis in adulthood (Katzman, 2005; Katzman & Misra, 2013; Rosen, 2010). Secondly, psychological consequences of ED can be exacerbated in adolescence as maturation processes are known to impact different areas of functioning (e.g. social, academic, identity development, interpersonal relationships; Bravender et al., 2011; Casey, Giedd, & Thomas, 2000). Despite the peculiarities associated with this developmental stage, prognosis has been found to be more favorable when the disorder appears in adolescence (Ratnasuriya, Eisler, Szmukler, & Russell, 1991; Steinhausen, 2002, 2009).

However, many studies examining comorbidities, consequences and the evolution of ED have studied this population as a whole without specifically targeting the adolescent population (Muratori et al., 2011). Therefore, expanding our knowledge of this specific population seems important considering the higher prevalence, the specific psychological and

physical challenges and the better prognosis associated with this age range. This could lead clinicians to improve their interventions with adolescent ED to promote a better long-term outcome.

This goal is particularly relevant considering that studies show that severe ED management is difficult and methods of treatment lack in efficacy (Goddard, Hibbs, et al., 2013; Wilson, Grilo, & Vitousek, 2007; Yager et al., 2014). For a specific ED treatment in a standardized context (inpatient, day care, outpatient), outcomes can differ from patient to patient (Yager et al., 2014). For example, a recent study investigating the efficacy of specialized inpatient treatment for adult AN found that, despite high rates of clinical improvement following treatment, approximately a third of participants (25 to 30%) showed no significant changes and a few showed deterioration (5 to 10%) on the outcome measures (Schlegl, Quadflieg, Löwe, Cuntz, & Voderholzer, 2014). To optimize treatment efficacy, future studies could investigate the many factors that can influence treatment response in individuals with ED (Schlegl et al., 2014). More specifically, recent studies have proposed that intra-personal characteristics could be a factor that affects response to treatment (Goddard, Hibbs, et al., 2013; Schlegl et al., 2014). Moreover, a study that surveyed 265 clinicians demonstrated that 98% mixed distinct intervention strategies to maximize treatment efficacy with this population (Tobin, Banker, Weisberg, & Bowers, 2007). This overlapping of clinical strategies shows the complexity of treating ED and demonstrates the importance of incorporating and understanding the individuality of the patient (APA, 2006). Hence, investigating the distinct patterns of functioning of individuals with ED seems like an interesting avenue to refine our understanding of this population.

In the adult population, three subtypes of individuals have been repeatedly identified among women presenting an ED using different models of classification (Claes et al., 2006; Wagner et al., 2006; Westen & Harnden-Fischer, 2001; Wonderlich et al., 2007). Those same three subtypes were also found in the adolescent population using the Shedler-Westen Assessment Procedure (SWAP-2000): a dysregulated/undercontrolled pattern characterized by impulsivity and emotional dysregulation, an avoidant/depressed pattern that shows emotional and interpersonal constriction and tendencies to feel depressed, anxious and inadequate, and a high-functioning/perfectionistic pattern that presents anxiety traits and perfectionism, while also presenting many healthy attributes (e.g. articulate, responsible, able to use abilities adequately, etc.; Gazzillo et al., 2013; Thompson-Brenner, Eddy, Satir, Boisseau, & Westen, 2008). Similar patterns were also found for a sample of inpatient adolescent girls using the Millon Adolescent Clinical Inventory (MACI): a high functioning group, an internalizing group and an externalizing group (Hopwood, Ansell, Fehon, & Grilo, 2010). However, evidence for these subtypes in adolescence remain limited both in number and in terms of the conceptual models used (SWAP-200 & MACI; Hopwood et al., 2010). Authors recommend to continue research in this particular field considering the clinical importance of the subtyping of ED in adolescence for formulating and planning treatment (Hopwood et al., 2010). Replicating these findings while using different measurements could potentially give strength to these 3 distinct patterns of functioning, while enhancing our understanding of the overall ED clinical picture that focuses not only on the core symptoms of the disorder, but also on the distinct features that can impact the clinical presentation of ED.

One method that can be used to study personal differences is by targeting the behavioral and affective profiles of difficulties of adolescents (Achenbach, 1991). This

conceptualization is widely recognized by both the scientific and clinical domains and allows a distinct vision of personal attributes (Bérubé & Achenbach, 2007). An advantage of this technique is that it combines studying a large scope of various emotional and behavioral problems while describing them in terms of the more global internalizing and externalizing clusters. Thus, it is possible to create the specific profile¹ of behavioral and affective difficulties of an adolescent. As it compares the results to standardized norms controlled for age and gender, it can highlight the specific emotional and behavioral problems that reach clinical thresholds (Achenbach, 1991). It is thus possible to simultaneously obtain a general profile of the psychological functioning of the adolescent, while also highlighting the prominent behavioral and affective problems that he presents.

A few studies have investigated the individual difficulties of adolescents presenting an ED using this conceptualization. One has compared the emotional and behavioral functioning of young adults (mean age at follow-up: 23) who had suffered from AN during their adolescence (Halvorsen, Andersen, & Heyerdahl, 2005). These psychopathological profiles were then compared to those of their siblings. Results show that girls who were diagnosed with AN in their adolescence presented more behavioral and emotional problems than their siblings, years after diagnosis. More specifically, the anxious-depressed difficulties were elevated for this group. As a group, they presented a general profile of behavioral and affective difficulties that was internalizing and that differed from norms. However, the study did not investigate if different patterns of behavioral and emotional problems were present

¹ The term profile is used in the Achenbach conceptualisation as a description of the global functioning of the

within the sample. A second study investigated more precisely this question with a sample of adolescent girls presenting an ED and found that girls with a ANR showed significantly less exteriorized problems than girls presenting a ANB (Ekeroth, Engström, Hägglöf, & Broberg, 2003). A third study investigated the behavioral and affective profile of inpatient adolescent girls presenting AN as reported by themselves and their parents and compared their results to a control group (Muratori, Viglione, Maestro, & Picchi, 2004). They found a higher percentage of patients in the clinical range for the internalizing cluster that was reported by both the patients and their parents. More specifically, the anxious-depressed and withdrawn subscales were elevated for the ED sample. They also found 3 distinct patterns of behavioral and emotional problems within the ED group: a “pure internalizing” group which was characterized by internalized difficulties that differed from norms, a “mixed” group characterized by both internalized and exteriorized problems that differed from norms and a “normative” pattern that was characterized by normative scores on both clusters.

These 3 studies provide evidence that in studying a wide scope of behavioral and affective difficulties in adolescent ED, it becomes possible to target specific difficulties that can be associated to the ED pathology. Consistent with research on ED comorbidities, they propose that adolescent ED is associated with an internalized profile of behavioral and affective problems where anxiety and depression levels are high (Ekeroth et al., 2003; Halvorsen et al., 2005; Muratori et al., 2004; Muratori et al., 2011). However, for many reasons it seems important to further investigate the emotional and behavioral difficulties found with this conceptualization.

Firstly, having a better understanding of the different profiles that can be found within this population could help refine the subtyping of adolescent ED. Indeed, the preliminary

patterns found by Muratori & al. (2004) seem to be consistent with the 3 subtypes of characteristics found by previous research using different conceptualizations (Gazzillo et al., 2013; Hopwood et al., 2010; Thompson-Brenner et al., 2008). However, as many authors have demonstrated that different intrapersonal characteristics can be associated with specific ED diagnosis (e.g. anorexia and perfectionism; Bardone-Cone et al., 2007; Cassin & Von Ranson, 2005; Pearson, Riley, Davis, & Smith, 2014; Vitousek & Manke, 1994), it is possible to wonder whether the heterogeneity found in those previous studies is associated uniquely to the different ED presentations. Thus, it would be interesting to study the behavioral and affective profiles of difficulties for a specific, homogenous subgroup of adolescent ED (Cassin & Von Ranson, 2005). Since ANR is the subtype of ED who most frequently needs inpatient treatment considering the dramatic impact it can have on physical and emotional health (Rosen, 2003), targeting this specific population seems relevant. Hence, to study ANR could help refine our understanding of the possible heterogeneity of this population, which comes out as homogenous on many other levels (e.g. symptom presentation, treatment setting, body image dissatisfaction). If different patterns of behavioral and emotional difficulties are found within this context, it could provide strength to the idea that adolescents presenting an ANR are a heterogeneous group, which could help understanding the different pathways of the evolution of the disorder, while also providing information on the underlining factors that can be associated with ED disorders.

Secondly, it would be interesting to investigate the relationship between the emotional and behavioral difficulties found within inpatient ANR and specific variables associated with the disorder. Intensity of the disorder is a construct that can discriminate between different levels of symptoms and manifestations associated with the condition. Hence, it is possible to

situate the individual on the continuum of intensity of the disorder and thus identify among adolescents with the same disorder those who have a more severe condition and those who are less affected by it. Since the specific features of a person can impact the way he responds to his environment, it is possible that different levels of behavioral and affective problems could be linked to specific intensity levels of ANR (Shiner & DeYoung, 2013). One way to conceptualize the intensity of the disorder is to assess the level of severity of each core symptom of the condition. In the case of ANR, these symptoms refer to the level of eating behaviors and attitudes presented by the person in relation to body dissatisfaction, bulimia and drive for thinness (Garner, 2004). For the purpose of this study, this conceptualization is preferred to the Body Mass Index (BMI) since in adolescence, BMI does not seem to reflect adequately the body composition of the individual, in part due to the body changes (i.e. maturation and growth) associated with this developmental stage (Probst & Goris, 2012; Trocki & Shepherd, 2000).

However, in the context of inpatient ANR, weight gain is a primary treatment goal (Goddard, Hibbs, et al., 2013). Indeed, even if it can be argued that change in BMI is not necessarily a valid way to measure clinical improvement in itself, it remains an important treatment goal of inpatient care (Rosen, 2010) as it represents an objective data that can be used to evaluate progress, prognosis and end of inpatient treatment. It would thus be relevant to investigate if specific behavioral and affective problems are related to weight gain during hospitalization. This could provide preliminary information on the possible association between emotional and behavioral difficulties and improvement during treatment.

Thus this study has three specific objectives, which are: 1) To describe the behavioral and affective profile of inpatient girls presenting a restricting type of anorexia; this description

will be further nuanced as a function of the distinct clinical profiles of behavioral and affective difficulties found within the sample; 2) To investigate the presence of a relationship between the behavioral and affective features and the intensity of the disorder; 3) To examine the presence of a relationship between the behavioral and affective features and weight gain during inpatient treatment.

For the first objective, the main hypothesis is that inpatient girls presenting a restricting type of anorexia will present higher levels of behavioural and affective problems for the Internalizing scale (and subscales) than for the Externalizing scale (and subscales). It is also proposed that the sample will score higher than norms for the Internalizing scale. More precisely, similarly to previous studies (Ekeroth et al., 2003; Halvorsen et al., 2005; Muratori et al., 2004), it is possible to think that the sample will present higher T-Scores than norms for the “anxious-depressed” subscale. For the second objective, the hypothesis is that a higher level of internalized difficulties would be associated with a higher intensity of the disorder. For the third objective, it is possible that specific behavioural and affective difficulties could be associated with weight gain during treatment. However, as this final objective is more exploratory, no clear hypothesis was drawn concerning the nature of the problems that could be correlated to changes in BMI during inpatient treatment.

Method

Participants

The initial sample consisted of 52 girls with a DSM-IV-TR diagnosis for a restricting type of anorexia nervosa at an Inpatient program unit for ED of the University Children’s Health Center in Montreal (Canada). Of the initial 55 participants, 3 girls (5.5% of the initial sample) had to be excluded because of missing data according to the standards of the

instruments (Achenbach, 1991; Garner, 2004). Age of participants ranged from 11,10 years old to 18.08 years old, with a mean age of 14.6 years old (SD: 1.59). Most participants (78.8%) were at their first inpatient treatment for an ED at time of completion of the questionnaires (M : 1.31; SD : 0.65), although the range of inpatient care ranged from one to four. Mean Body Mass Index (BMI) at admission was 14.96 (SD : 1.83) and it was found that 62.7% of the sample had a BMI under the 3th percentile while 88.2% of the sample were under the 10th percentile at the time of admission (Kuczmarski et al., 2002).

Measures

Youth Self Report.

Youth-Self Report (YSR) is a self-administered questionnaire designed for adolescents aged 11 to 18 (Achenbach, 1991). YSR is part of the Achenbach system, which is widely used as a standard measure for assessing emotional and behavioral problems in children and adolescents. Containing 112 items that can be scored using a three-point Likert scale, it measures different behavioral and affective characteristics. Results can be computed in 8 empirically based syndrome subscales. 2 higher order clusters (Internalizing and Externalizing scales) and 1 Total Problem item scale can be used to examine the global profile of participants. Norms for each age and gender allow comparisons between the adolescent and his peers (Achenbach, 1991; Achenbach et al., 2002; Achenbach & Ruffle, 2000). Hence, it is possible to evaluate if the sample is considered normative, borderline or clinical using Achenbach's cut-off points (Achenbach, 1991). For the global scales of the YSR, a mean T -score superior to 60 is considered borderline (meaning that less than 10% of adolescents girls reach that threshold) while a T -Score superior to 64 is considered clinical (less than 2% of the normative sample reach that threshold). An average T -Score superior to 64.5 is considered

borderline and a *T*-Score superior to 69.5 is considered clinical for the subscales of the YSR. Cronbach coefficients between subscales range from .71 and .95 (Anxious/depressed: .84; Withdrawn/depressed: .71; Somatic Complaints: .80; Social Problems: .74; Thoughts Problems: .78; Attention Problems: .79; Rule-Breaking behaviour: .81; Aggressive Behaviour: .86; Internalizing: .90; Externalizing: .90; Total Problems: .95) proving good internal consistency, while content validity has been shown by years of research, consultation and retroaction on the ASEBA tools (Achenbach & Rescorla, 2001).

Eating Disorder Inventory.

Eating Disorder Inventory (EDI-3) is a self-administered questionnaire designed to evaluate eating disorder symptoms (Garner, 2004). For the purpose of this study the “Eating Disorder Risk Composite” (EDRC) was used as an indicator of the intensity of the disorder. The (EDRC) can provide information on the level of eating behaviors and attitudes related to the core symptoms associated with ED (Garner, 2004). Research has demonstrated that this higher order construct of the Eating Disorder Inventory (EDI-3) is related to the development and maintenance of ED (Garner, 2004). Higher *T*-Score on the EDRC can thus discriminate between distinct levels of intensity of the disorder. This composite scale combines the 3 following subscales: drive for thinness (DT), body dissatisfaction (BD) and bulimia (B; Garner, 2004). When using EDI-3 scoring technique to assess the internal consistency of the instrument for adolescents with ANR, Cronbach coefficients range from .63 to .93 (DT: .93; B: .63; BD: .93) for the 3 subscales with a Alpha Coefficient of .91 for the global scale (EDRC). A significant correlation of .60 between the EDRC and the EAT-26 for 110 adolescents diagnosed with an ED disorder demonstrates the content validity of this composite scale (Cumella, 2006; Garner, 2004). One advantage of this tool is that it takes into account,

according to norms, the specific diagnosis of the individual in rating the intensity of the condition.

Body Mass Index.

Body Mass index is a value calculated by dividing the weight in kilograms by height in meters squared (Kuczmarski et al., 2002). In the context of inpatient ED, this indicator is used to report change in weight during treatment. It is thus the value that will be used in this study as a measurement of weight gain between admission and end of inpatient treatment.

Procedure

Informed and signed consent from one parent and the adolescent was obtained for all study participants and the ethics committee of the hospital formally approved the study. Participants were given the YSR and the EDI-3 to complete following admission on the inpatient treatment unit. All participants had to be in a stabilized state (physiologically and psychologically) in order to participate in the study. Research assistants were available to answer questions and retrieve questionnaires once completed. The hospital staff assessed weight and height of participants upon admission and at the end of inpatient treatment. Research assistants then calculated BMI and BMI ratios using these measures.

Data Analysis Strategy

Data were analysed using IBM Statistical Package for the Social Sciences (SPSS) 21.0 for Mac. For the first objective of the study, analyses were mostly descriptive in nature (M , SD) thus describing the sample in terms of their behavioral and affective characteristics. For the second and third objectives, Spearman correlation coefficients were used. Effect sizes are reported as eta squared for analyses of variance and as Spearman's r for non-parametric correlations. Bonferroni corrections were also used for the second (associations between YSR

and EDRC) and third (associations between YSR and BMI ratio) objectives as multiple Spearman correlations were conducted to investigate the presence of a relationship between the behavioural and affective problems and the variables related to the disorder.

Results

1. Description of the behavioural and affective profile of the sample

Normalised *T*-Scores controlling for gender and age were used to illustrate the characteristics of our sample. Average *T*-score of the sample for the Internalizing scale reached the clinical threshold ($M= 67.17$, $SD= 11.66$) whereas average *T*-score for the Externalizing scale was in the normative range ($M= 50.27$, $SD=8.66$). A paired-samples *T*-test was conducted to compare *T*-Scores on both scales. There was a significant difference between the average *T*-score on the Internalizing ($M=67.17$, $SD= 11.66$) and Externalizing ($M=50.27$, $SD= 8.66$) scales, $t(51)= 13.54$, $p < .0005$ (two-tailed). The eta squared statistic (0.78) indicated a large effect size. Average *T*-score of the sample for the Total Problem scale was in the normative range ($M=58.00$, $SD= 10.16$).

Mean *T*-Scores for each subscale were then analyzed to determine more specifically which behavioural and affective problems were prominent in the sample. The sample scored higher than norms on the withdrawn-depressed (M *T*-score: 66) and the anxious-depressed subscales (M *T*-score: 65) while mean *T*-Scores for other characteristics were normative. Figure 1 shows the average *T*-scores of the sample on the global scales and on the subscales of the questionnaire.

04). Both relationships stayed statistically significant after applying the Bonferroni correction for multiple comparisons. No association was found between the Internalizing scale of the YSR and the BMI ratio.

When conducting secondary Spearman analyses between the subscales of the YSR and the BMI ratio, moderate and negative associations were found for both the rule-breaking ($r=-.426$, $n=50$, $p=0.002$) and the aggressive behaviours ($r=-0.301$, $n=50$, $p=0.034$) subscales of the YSR. A negative but weaker association was found between the somatic complaint ($r=0.287$, $n=50$, $p=0.043$) subscale and the BMI ratio. However, when applying the Bonferroni correction for multiple comparisons only the association between the rule-breaking subscale of the YSR and the EDRC stayed significant.

Discussion

This study examined the behavioural and affective profile of adolescent girls treated for an ANR in an inpatient care unit. We observed that the mean score obtained by the sample was higher on the Internalizing scale compared to norms. More specifically, patients reported more difficulties related to depression, anxiety and withdrawal than most girls their age. This is consistent with the primary hypothesis of this study, which proposed a global score for the Internalizing scale that would differ from norms. It is also in accordance with previous findings showing that adolescents with ED tend to present an internalizing profile of functioning (Ekeroth et al., 2003; Halvorsen et al., 2005; Lewinsohn, Striegel-Moore, & Seeley, 2000; Muratori et al., 2004; Muratori et al., 2011; Steinhausen, 2002). These findings also add to the literature that shows high comorbidity with anxiety disorders and depression for eating disorders (Swanson et al., 2011; Swinbourne et al., 2012).

An important variable to consider when interpreting these results is that a prolonged state of starvation can result in symptoms of depression (Couturier, 2004; Mattar, Huas, Duclos, Apfel, & Godart, 2011). As malnutrition is a core symptom of ANR, it is difficult to

determine whether the depressive and anxious difficulties reported were present before the onset of the disorder or if they are a consequence of the ANR. However, research has not been able to confirm the hypothesis that malnutrition partly causes depression and anxiety in acute AN yet (Mattar et al., 2011; Mattar, Huas, group, & Godart, 2012). Furthermore, longitudinal studies seem to demonstrate that anxiety and depression are stable years after remission and authors propose that these difficulties are associated more to personality traits present in this population than to the state of malnutrition in acute AN (Halvorsen et al., 2005; Holtkamp, Müller, Heussen, Remschmidt, & Herpertz-Dahlmann, 2005). When taking these findings into account and adding the specific design of this study that prohibited girls to participate if their physiological functioning had not been stabilized yet, it is possible to hypothesize that the results found are more related to the individual functioning of the sample than to their state of malnutrition.

Different ED profiles

Of particular interest, our findings provide evidence that in a homogenous sample of inpatient adolescent girls treated for an ANR, it is possible to find three different patterns of behavioural and affective difficulties. These findings seem to promote the idea that even in a specific inpatient ED sample where symptoms presented by the patients are quite similar, there can be important individual differences in their overall functioning. Moreover, the present results replicate the 3 different subgroups found by Muratori & al. (2004) with an inpatient sample of both ANR and ANB: One normative subgroup, one purely internalizing subgroup with high levels of anxious, depressed and withdrawn problems, and one subgroup showing emotional and behavioural difficulties on both the Internalizing and Externalizing scales. It seems relevant to mention that most participants of the sample (57,8%) reached the clinical

thresholds for either only the Internalizing scale (53,8%) or both the Internalizing and Externalizing scales (4%). Hence, these results demonstrate that this population is likely to present with other difficulties that are significantly more prominent than most girls their age. Also, similarly to the results of Muratori et al. (2004) no “pure externalizing” profile was found in our sample which shows that, in both studies, the presence of an externalizing profile of difficulties reaching the clinical threshold was always associated with an internalized profile of difficulties that reached the clinical threshold as well. This finding is consistent with the literature on adolescents demonstrating that girls who present conduct disorders have higher risks than boys to also present internalizing difficulties (Zahn-Waxler, Shirtcliff, & Marceau, 2008).

Since these profiles emerged from a questionnaire measuring a wide range of behavioural and affective problems, it is possible to compare them to other findings on individual differences in ED population. Doing so, we can relate these results to the 3 personality subtypes that emerged in the adolescent population with ED (AN, BN and OSFED): the high-functioning-perfectionistic, the avoidant-depressed and the dysregulated groups (Thompson-Brenner et al., 2008). Interestingly, these distinct personality subgroups seem related to the 3 patterns of emotional and behavioural difficulties found in the present study: one shows a group of adolescents that seems to have normative personality prototype, one seems to present difficulties restricted to the internalized functioning, while the last group reports a more deregulated functioning associated with both internalizing and externalizing difficulties. Hence, this paper gives strength to this specific subtyping of ED in adolescence by replicating on the YSR with a homogenous sample of inpatient girls presenting an ANR the 3 subtypes found with other conceptual models. In the future, it would be interesting to assess

the personality subtypes measured with the SWAP-200 and the psychopathological profiles of affective and behavioural characteristics to investigate this proposition regarding the association between these three distinct subtypes of individuals within this population of adolescent girls presenting an ANR.

Intensity of the disorder

Using the EDRC as an indicator of intensity of the disorder, results consistently showed that a greater intensity of the eating problem was associated with a more clinical profile of behavioural and affective difficulties. This association demonstrates that adolescents reporting more emotional and behavioural problems (both for the Internalizing and Externalizing scales) were also the ones reporting more severe behaviours and cognitions with regards to AN core symptoms. This result is consistent with the initial hypothesis that there would be a positive association between the score on the EDRC and the scores for the internalizing problems. However, results also present a strong association for the externalizing difficulties. This seems to demonstrate that the higher is the intensity of the anorexia the more the adolescent will present emotional and behavioural problems of any kind.

This result appears consistent with previous findings that demonstrated in a sample of adult women with ED that comorbidities are associated with the severity of the symptoms (Spindler & Milos, 2007). The fact that every behavioural and affective characteristic measured was linked with intensity of the diagnosis also seems consistent with the multiple comorbidities and personality disorders associated with the presence of ED in other studies (Muratori et al., 2011; Steinhausen, 2002; Swanson et al., 2011; Swinbourne et al., 2012). Indeed, different other disorders are associated with ED, whereas results from the present study demonstrate that different behavioural and affective problems (anxiety, opposition,

depression, rule-breaking-behaviors, attention problems, somatic complaints, social problems, etc.) seem associated with the intensity of the disorder. However, the strength of the associations found demonstrated a stronger relationship between intensity of the disorder and the following difficulties: anxious-depressed, somatic complaints, thought problems, rule-breaking behaviours, aggressive behaviours and attention problems. Hence, it seems that certain emotional and behavioural problems are more strongly linked to the intensity of ANR. The association found between thought problems and intensity of ANR seems coherent with the pervasive thoughts that are associated with this diagnosis (Kaye, Fudge, & Paulus, 2009). Indeed, it seems probable that a girl who reports a greater intensity of AN will also have greater difficulties getting her mind off certain thoughts. For example, a patient could think that she has strange ideas in her mind as a consequence of the recurrent thoughts associated with body dysmorphia. This can also lead this patient to have trouble sleeping. A similar reality can be found for somatic complaints as girls who have a more clinical ANR can also present more stomachaches, nausea and tiredness due to the physical impacts of the malnutrition they have endured prior to hospitalization. Hence, for these 2 particular subscales, it seems more difficult to differentiate between the behavioural and affective difficulties measured by the YSR and the consequences of the symptoms associated with ANR (on cognition and physical complaints).

However, the strong associations found between the externalizing problems and intensity of the disorder can more difficultly be explained by the core pathology of ED. As girls who presented higher level of rule breaking and aggressive behaviours also presented higher levels of internalized difficulties (as described previously), one hypothesis could be that these girls reported more problems in different areas of their functioning, which could be

linked to a more severe form of ANR. As it is well established that there is a high rate of change in diagnosis over the course of ED (Eddy et al., 2008; Milos, Spindler, Schnyder, & Fairburn, 2005), it could be hypothesized that girls presenting a profile of externalizing difficulties could be those whose ANR will evolve towards an ED where compensatory behaviours are present (ANB or Bulimia) in the future.

BMI as an indicator of weight gain

Since gaining weight can be an important goal of inpatient treatment and of recovery (Rome et al., 2003), the BMI ratio between admission and end of treatment was used as an indicator of the amelioration of the individual during treatment. Exploratory results from this study show that patients reporting a higher score on the externalized scale of behavioural and affective problems gained less weight during inpatient treatment. When measuring each externalizing difficulty, it was possible to identify that rule-breaking behaviours was negatively correlated to weight after applying Bonferroni corrections for multiple analyses. This association seems to demonstrate that adolescents who present more rule-breaking behaviours tend to be those who gain less weight during inpatient treatment. On the basis of these findings, it is possible to hypothesize that patients who presented more externalized difficulties were less compliant to the treatment proposed or that the treatment offered was less appropriate for them in regards to weight gain. It would be interesting to measure the engagement in treatment for these specific girls.

Results did not present any association between the internalized emotional and behavioural difficulties and weight gain during admission. Hence, the level of internalizing difficulties presented by the teenager is not associated with change in body weight during

inpatient treatment. Therefore, these results raise the question as to whether treatment strategies could be better adapted to certain types of patients.

Limitations

Despite the interesting results found in this study, different limitations have to be considered. First, all questionnaires used in the present study were self-reports completed by the adolescent. It is therefore possible that girls who were more inclined to self-disclosure reported both a greater intensity of the disorder and more clinical features, leading to a bias in the correlation results. Since studies have shown that adolescents are less prone to deny symptoms when duration of illness is longer (Couturier & Lock, 2006; Viglione, Muratori, Maestro, Brunori, & Picchi, 2006), replication of the present findings while taking into account this variable would allow to investigate if duration of illness could be linked with greater self-disclosure from participants. Third, considering the homogeneity of the sample, results from this study can be generalized only to a specific population: adolescent inpatient girls with an ANR.

Clinical implications

Despite these limitations, the present paper offers relevant findings for clinical settings. First, it adds to the literature on subtyping adolescent ED by proposing different behavioural and affective profiles that can be found within a sample of inpatient adolescent girls with an ANR. The homogenous nature of the sample (inpatient adolescent girls presenting an ANR) is especially relevant in this context, as it demonstrates that even for a highly specific subgroup of adolescent with ED, there are individual differences between patients. As clinical settings often offer standardized treatment (Yager et al., 2014), the present findings add to the literature that promotes the need for individualized care (Goddard,

Raenker, et al., 2013; Schlegl et al., 2014). Indeed, management of acute ED is known to be complex (Goddard, Hibbs, et al., 2013; Yager et al., 2014). These profiles are similar to those found with other conceptual models and tools (i.e. SWAP-200 and MACI) and thus give strength to the specific heterogeneity found for this population in an inpatient setting, even with a group of individuals specifically presenting the restricting type of AN. The 3 subtypes could thus be further studied in trying to understand if this diversity could be associated with different evolutions of the disorder within the inpatient settings and after treatment. For example, a longitudinal study could test the hypothesis that girls presenting externalizing difficulties could be the ones whose diagnosis could eventually evolve in their clinical presentation to an ANB.

A second important finding is the associations found between behavioural and affective problems and the intensity of the disorder. This implication is important as it suggests that patients who report a higher intensity of the ANR will also be those who report more problems in other areas of functioning. Hence, the present findings give strength to the proposition that a broader assessment of inpatient adolescent girls with an ANR would allow for a better understanding the functioning of these complex cases. It is also possible to hypothesize that an individualized form of treatment that takes into account the different areas of difficulties of the patient can be beneficial. This study proposes that a more elevated level of externalizing difficulties could be associated with a less important weight gain. This is an important finding, as it seems to demonstrate that the presence of externalizing problems could possibly intervene with treatment. Hence, these findings show that the presence of externalizing difficulties, mostly associated with ED with bingeing/purging characteristics, could be an important factor to take into account to better understand the underlining

functioning of adolescents with ANR. In the future, it would be interesting to measure whether other variables associated with treatment response (e.g.: therapeutic alliance, motivation for change) also differ depending on the presence of externalizing difficulties as reported by the patient.

Finally, these results shed light on the wide range of personal difficulties that this otherwise homogenous group of patients can report and how these problems can be associated with the presentation of their ED.

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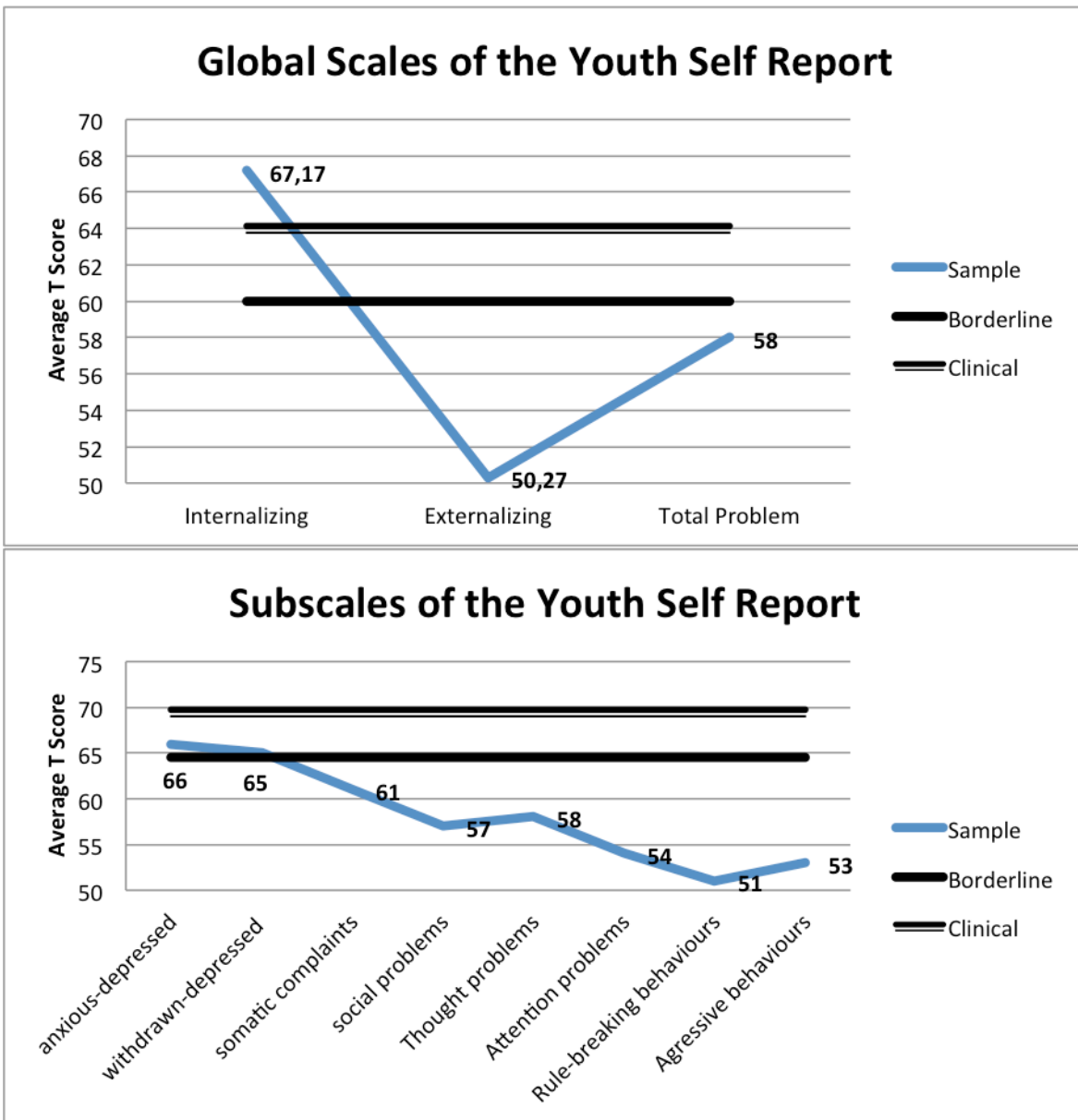


Figure 1. Illustration of the average *T*-scores of the sample on the global scales and subscales of the Youth Self Report.

