Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity (2019) 24:645–649
https://doi.org/10.1007/s40519-019-00727-3

BRIEF REPORT

The behavioral and affective profile of inpatient adolescent girls with restrictive anorexia nervosa

Chloé Paquin Hodge[1] · Dominique Meilleur[1] · Danielle Taddeo[2] · Jean-Yves Frappier[2]

Received: 22 February 2018 / Accepted: 4 June 2019 / Published online: 19 June 2019

Abstract

Background A better understanding of the individual difficulties reported by adolescents presenting with anorexia nervosa seems like an interesting avenue to refine our understanding of their psychological functioning.

Objective This study aimed to: (1) describe the behavioral and affective profile of difficulties of inpatient adolescent girls presenting a restricting type of anorexia (ANR); and (2) investigate the presence of a relationship between behavioral and affective problems and severity of the disorder.

Methods The sample consisted of 52 inpatient adolescent girls presenting an ANR. The youth self report assessed the behavioral and emotional profile of difficulties of participants while the Eating Disorder Risk Composite of the Eating Disorder Inventory measured the symptomatology of the disorder. A ratio between body mass index at admission and at the end of the treatment served as an indicator of weight gain.

Results The sample presented an internalized profile of problems. Individual differences were found and three profiles of difficulties were present in the sample: normative, pure internalizing and mixed (clinical on the internalizing and externalizing clusters).

Conclusion This study provides information on the heterogeneity of this specific population otherwise quite similar and demonstrates how severity of the disorder can be associated with a wide range of other behavioral and affective difficulties.

Level of evidence Level V, cross-sectional descriptive study.

Keywords Anorexia nervosa · Adolescence · Eating disorders · Youth self report

Introduction

Eating disorders (ED) are recognized as the third most common chronic illness among adolescents [1]. Given the specific challenges associated with this developmental stage, adolescents with an ED have an elevated risk of physiological and psychological difficulties. However, prognosis has been found to be more favorable when the disorder appears during this period [2]. Intervening adequately at that period is thus particularly important.

In the adult population, three subtypes of individuals have been repeatedly identified among women presenting an ED: 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. Similar patterns were

This manuscript is based on a doctoral thesis which can be accessed on the Papyrus repository website, which archives all theses approved by Université de Montreal in their original version. Please note that this website does not constitute a publication. The present thesis was later synthesized into this manuscript for publication purposes. The thesis has never been published or shared elsewhere prior to the present submission to the journal of *Eating and Weight Disorders: studies on Anorexia, Bulimia and Obesity.*

This article is part of topical collection on Personality and Eating and Weight Disorders.

✉ Chloé Paquin Hodge
chloe.paquin.hodge@gmail.com

✉ Dominique Meilleur
dominique.meilleur@umontreal.ca

[1] Department of Psychology, University of Montreal, Montreal, QC, Canada

[2] Sainte-Justine University Health Center Mother and Child, Montreal, QC, Canada

also found in adolescents, although evidence for these subtypes before adulthood remains limited both in number and in terms of the conceptual models used [3, 4].

With adolescents, a method that is very often employed to study their personal differences is by targeting their behavioral and affective profiles of difficulties [5]. A few studies have investigated the individual difficulties of adolescents presenting an ED using this conceptualization. They demonstrated that adolescent girls with anorexia nervosa presented an internalized profile of behavioral and affective problems that differed from norms with elevated levels of anxiety and depression [6–8]. However, to our knowledge, no study looked precisely at the behavioral and affective profile of a homogenous group of adolescent girls hospitalized for a restricting type of anorexia (ANR) and looked at the association between the profiles found and eating disorder symptomatology.

This study has two specific objectives: (1) to describe the behavioral and affective profile of inpatient girls presenting a ANR, and (2) to investigate the presence of a relationship between the behavioral and affective features and the severity of the disorder. For the first objective, it is hypothesized that inpatient girls presenting an ANR will show higher levels of behavioral and affective problems for the internalizing scale (and subscales) than for the externalizing scale (and subscales). For the second objective, the hypothesis is that a higher level of internalized difficulties would be associated with a greater severity of the disorder.

Method

Participants

All participants were recruited from an Eating Disorder Program of the University Children's Health Center, Montreal (Canada). Treatment at this inpatient unit consists of group therapy and a daily individual follow-up by one of the nurses working on the unit. All patients also receive daily medical follow-ups.

To ensure representative results, data were obtained for all consecutive admission of adolescent girls hospitalized for an ANR who consented to participate in research. The initial sample consisted of 55 girls diagnosed with ANR by pediatrician specialized in ED using the criteria of the DSM-IV-TR. Three 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 to 18.08 years, with a mean age of 14.6 years (SD: 1.59). Most participants (78.8%) were at their first hospitalization for an ED at the time of completion of the questionnaires *(M*: 1.31; SD: 0.65), although the range of inpatient stay 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 3rd percentile while 88.2% of the sample were under the 10th percentile at the time of admission.

Procedure

Informed and signed consent from one parent and the adolescent was obtained for all participants. The ethics committee of the hospital formally approved the study.

Participants were given the youth self report and the Eating Disorder Inventory to complete the following admission to the inpatient unit. To participate in the study, vital signs and attentional capacity of participants are needed to be stable. Hence, patients were assessed by their doctor to ensure that their physical state did not influence their capacity to fill out the questionnaires. Research assistants were available to answer questions and retrieve questionnaires once completed. The hospital staff assessed weight and height of participants upon admission.

Measures

Youth self report

Youth self report (YSR) is a self-administered questionnaire designed for adolescents aged between 11 and 18 years [5]. 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 eight empirically based syndrome subscales. Two higher order clusters (internalizing and externalizing scales) and one total problem item scale are used to examine the global profile of participants. Norms for age and gender allow comparisons between the adolescent and his peers by giving information on whether the sample is considered normative, borderline or clinical using Achenbach's cut-off points [5]. Cronbach coefficients between subscales range from 0.71 to 0.95 proving good internal consistency, while content validity has been shown by years of research, consultation, and retroaction on the Achenbach system.

Eating Disorder Inventory

Eating Disorder Inventory (EDI-3) is a self-administered questionnaire designed to evaluate eating disorder pathology [9]. For the purpose of this study the "Eating Disorder Risk Composite" (EDRC) was used as an indicator of the symptomatology of the ED. The EDRC can provide information on the level of eating behaviors and attitudes related to the core symptoms associated with ED [9]. Research has demonstrated that this higher order construct of the Eating

Disorder Inventory (EDI-3) is related to the development and maintenance of ED. It combines the three following subscales: drive for thinness (DT), body dissatisfaction (BD) and bulimia (B). Cronbach coefficients range from 0.63 to 0.93 for the three subscales with an alpha coefficient of 0.91 for the global scale (EDRC). A significant correlation of 0.60 between the EDRC and the EAT-26 for 110 adolescents diagnosed with an ED disorder demonstrates the content validity of this composite scale [9].

Data analysis strategy

Data were analyzed using IBM Statistical Package for the Social Sciences (SPSS) 21.0 for Mac. For the first objective, analyses were mostly descriptive (*M*, SD) as we reported mean *T* scores of participants on the scales of the youth self report that controlled for age and gender. A paired sample *T* test was also conducted to compare *T* scores on both scales. For the second objective, association between the behavioral and affective profiles and the eating disorder symptomatology was investigated using Spearman's *r* for non-parametric correlations, as the data were not normally distributed. We controlled for multiple comparisons with Bonferroni corrections. Effect sizes are reported as eta squared for analyses of variance.

Results

Description of the behavioral and affective profile of the sample

Figure 1 shows average *T* scores of the sample on the global scales and on the subscales of the questionnaire. Average *T* score 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). There was a significant difference between 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, $p < 0.001$ (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. The sample scored higher than norms on the withdrawn-depressed (M *T*-score: 66) and the anxious-depressed (M *T*-score: 65) subscales, while mean *T* scores for the other characteristics were normative.

The sample was then subdivided in terms of the distinct behavioral and affective profiles found among participants. This classification was based on the clinical thresholds of Achenbach's norms [5] for the global scales of the instrument. This method led to three different subgroups within

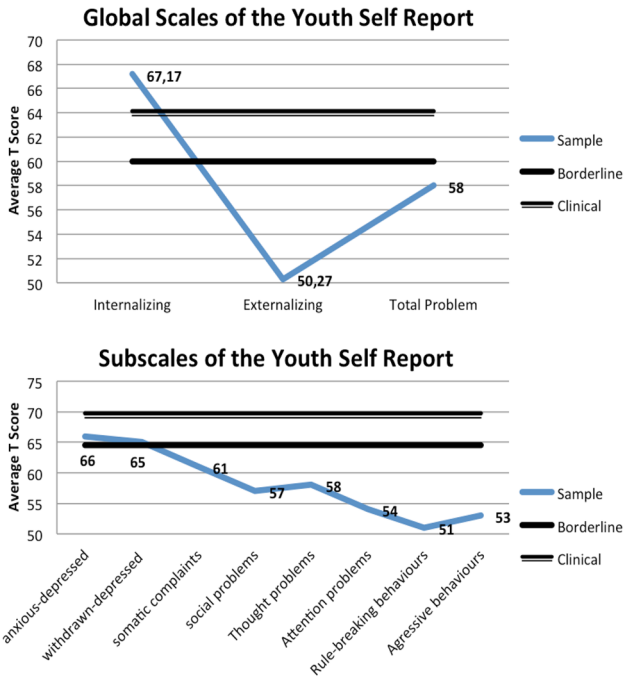

Fig. 1 Average *T* scores of the sample on the global scales and subscales of the youth self report

the sample: one "pure internalizing" (53.8% of the sample) that met clinical level for the internalizing scale, one "normative" (42.2% of the sample) that did not reach clinical threshold for both global scales, and one "mixed" (4%) that reached the threshold for both the internalizing and externalizing scales. No "pure externalizing" group was found within the sample.

Relationship between the behavioral and affective characteristics measured and the eating disorder symptomatology

Strong positive relationships were found between the three global scales of the YSR and the EDRC: internalizing scale $r = 0.678$, $n = 52$, $p < 0.001$; externalizing scale $r = 0.625$, $n = 52$, $p < 0.001$; Total Problem scale $r = 0.707$, $n = 52$, $p < 0.001$. These associations stayed statistically significant when applying a Bonferroni correction for multiple comparison analyses.

Strong positive associations with ED symptomatology were found for the following subscales of the YSR: anxious-depressed ($r = 0.682$, $n = 52$, $p < 0.001$), somatic complaints ($r = 0.641$, $n = 52$, $p < 0.001$), thought problems ($r = 0.604$, $n = 52$, $p < 0.001$), rule breaking behaviors ($r = 0.568$, $n = 52$, $p < 0.001$), aggressive behaviors ($r = 0.529$, $n = 52$, $p < 0.001$), and attention problems ($r = 0.622$, $n = 52$, $p < 0.001$). Moderate associations were found for the following subscales: withdrawn-depressed ($r = 0.433$, $n = 52$,

$p = 0.001$) and social problems ($r = 0.478$, $n = 52$, $p < 0.001$). All correlations between subscales of the YSR and the EDRC stayed statistically significant when applying a Bonferroni correction for multiple comparison analyses.

Discussion

This study examined the behavioral and affective profile of adolescent girls hospitalized for an ANR. 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 of their age, which is in accordance with previous findings showing that adolescents with ED tend to present an internalizing profile of functioning [2, 6–8] with high levels of personal distress when compared to control adolescents [10]. Our findings are also aligned with research on adults showing that EDs often coincide with psychopathology characterized by negative affect [11, 12].

This report provides evidence of three different patterns of difficulties in a homogenous sample (diagnosis, age, treatment setting) of inpatient adolescent girls treated for ANR. These results suggest that even in a specific inpatient sample of adolescents with ANR, there can be important individual differences in their overall functioning. Moreover, these results replicate the three different subgroups found by Muratori et al. (2004) with an inpatient sample of both ANR and ANB, and are similar to the personality subtypes found in the adolescent population with ED with different assessment tools: the high functioning perfectionistic, the avoidant-depressed, and the dysregulated groups [3, 4]. Our study shows similar subgroups, with a normative subgroup that can be compared to the high functioning perfectionistic group presenting healthier attributes, a subgroup with tendencies towards depressive affect and emotional constriction (internalizing profile) and a subgroup presenting more emotional dysregulation and impulsivity ("mixed" profile). Hence, this paper gives strength to this specific subtyping of ED in adolescence by replicating with a homogenous sample the three subtypes found with other conceptual models.

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 provide further evidence that this population is likely to present with other difficulties. The question remains as to whether these difficulties reported after admission were present before the onset of the illness. Recent studies have suggested that problems in social and interpersonal relationships might represent a risk factor in the development of an ED, and that the onset of the illness might in turn further compromise these relationships [13]. Our results cannot statute on the presence of these behavioral and affective problems before the onset of their AN, but it can be hypothesized that the consequences of the disorder on their functioning exacerbated these difficulties. This is particularly relevant for our participants, as admission to the inpatient unit represented a rupture in their daily functioning: school, relationships (with family, peers, and romantic interest), and hobbies.

No pure externalizing profile was found within our sample, which is not surprising considering that all participants had a diagnosis of ANR and that externalizing features are usually associated with ANB or B. This result is consistent with the literature on adolescents demonstrating that girls who present with conduct disorders are more likely than boys to also show internalizing difficulties [14]. As it is well established that there is a high rate of change in diagnosis over the course of ED, it could be hypothesized that girls presenting a profile of both internalizing and externalizing difficulties could be those whose ANR will evolve towards an ED where compensatory behaviors are present (ANB or Bulimia) in the future. Future longitudinal studies would be needed to confirm the diagnostic crossover towards binge–purging symptomatology.

Using the EDRC as an indicator of eating disorder symptomatology, results consistently showed that a greater symptomatology of the eating disorder was associated with a more clinical profile of behavioral and affective difficulties. We had hypothesized that internalizing difficulties would be correlated with symptomatology of the ED; however, our findings also demonstrate a strong association for externalizing difficulties. Hence, results suggest that the greater the symptomatology of the ANR, the more the adolescent will present with emotional and behavioral problems of any kind. Given that externalizing difficulties are not frequently reported in this population, our data encourage assessing them in a dimensional manner to better comprehend the links between these symptoms and the ANR symptomatology.

Limitations

Despite the interesting findings of this study, different limitations have to be considered. First, all questionnaires used were self-reports completed by the adolescent. It is possible that girls who were more inclined to self-disclosure reported both greater symptomatology of the disorder with the EDI-3 and more clinical features with the YSR, leading to a bias in the results. Second, the subtyping of participants was made a posteriori, according to the cut-off points of the YSR and was not obtained through statistical analyses. We did not have a control group in this study, but compared the participants to the standardized norms of each instruments. 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

The present paper offers relevant findings for clinical settings. First, it adds to the literature on the subtyping of individuals with EDs by proposing different behavioral and affective profiles that can be found within a sample of adolescents with AN. 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 adolescents; there are individual differences between patients. Future longitudinal studies could assess whether response to treatment differs depending on this subtyping. As clinical settings often offer standardized treatments, the present findings add to the literature that promotes the need for individualized care. 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.

Acknowledgements This research was funded by the Fonds de Recherche du Québec-Société et Culture (FRQSC).

Funding This study was funded by FRQSC (Fonds de recherche du Québec-Société et Culture), Award number: R0019054.

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding authors state that there is no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study was approved by the research ethic committee of the Ste-Justine University Children's Health Center in Montreal (Comité d'Éthique à la Recherche-CÉR) which is affiliated to the University of Montréal. There is a collaboration agreement between the research ethic committee of the University of Montreal (FAS) and the CÉR as both are affiliated together.

Informed consent Informed consent was obtained from all individual participants included in the study.

References

1. Herpertz-Dahlmann B (2015) Adolescent eating disorders: update on definitions, symptomatology, epidemiology, and comorbidity. Child Adolesc Psychiatr Clin North Am 24(1):177–196. https://doi.org/10.1016/j.chc.2014.08.003
2. Steinhausen H-C (2002) The outcome of anorexia nervosa in the 20th century. Am J Psychiatry 159(8):1284–1293. https://doi.org/10.1176/appi.ajp.159.8.1284
3. Hopwood CJ, Ansell EB, Fehon DC, Grilo CM (2010) Personality heterogeneity in female adolescent inpatients with features of eating disorders. Compr Psychiatry 51(6):585–591. https://doi.org/10.1016/j.comppsych.2010.03.006
4. Thompson-Brenner H, Eddy KT, Satir DA, Boisseau CL, Westen D (2008) Personality subtypes in adolescents with eating disorders: validation of a classification approach. J Child Psychol Psychiatry 49(2):170–180. https://doi.org/10.1111/j.1469-7610.2007.01825.x
5. Achenbach TM (1991) Manual for the youth self-report and 1991 profile. Department of Psychiatry, University of Vermont, Burlington
6. Ekeroth K, Engström I, Hägglöf B, Broberg AG (2003) Self-reported competencies and problems among Swedish girls with eating disorders and a control sample, using the Youth Self-Report. Eat Weight Disord 8(4):274–281. https://doi.org/10.1007/s007870170025
7. Halvorsen I, Andersen A, Heyerdahl S (2005) Girls with anorexia nervosa as young adults. Eur Child Adolesc Psychiatry 14(7):397–406. https://doi.org/10.1007/s00787-005-0489-0
8. Muratori F, Viglione V, Maestro S, Picchi L (2004) Internalizing and externalizing conditions in adolescent anorexia. Psychopathology 37(2):92–97. https://doi.org/10.1002/erv.1152
9. Garner DM (2004) The eating disorder inventory-3: professional manual. Psychological Assessment Resources Inc., Lutz, FL
10. Peres V, Corcos M, Robin M, Pham-Scottez A (2018) Emotional intelligence, empathy and alexithymia in anorexia nervosa during adolescence. Eat Weight Disord Stud Anorex Bulim Obes. https://doi.org/10.1007/s40519-018-0482-5
11. Mitchell KS, Wolf EJ, Reardon AF, Miller MW (2014) Association of eating disorder symptoms with internalizing and externalizing dimensions of psychopathology among men and women. Int J Eat Disord 47(8):860–869. https://doi.org/10.1002/eat.22300
12. Sala M, Egbert AH, Lavender JM, Goldschmidt AB (2018) Affect, reward, and punishment in anorexia nervosa: a narrative overview. Eat Weight Disord 23(6):731–737. https://doi.org/10.1007/s40519-018-0588-9
13. Cardi V, Mallorqui-Bague N, Albano G, Monteleone AM, Fernandez-Aranda F, Treasure J (2018) Social difficulties as risk and maintaining factors in anorexia nervosa: a mixed-method investigation. Front Psychiatry 9:12. https://doi.org/10.3389/fpsyt.2018.00012
14. Zahn-Waxler C, Shirtcliff EA, Marceau K (2008) Disorders of childhood and adolescence: gender and psychopathology. Annu Rev Clin Psychol 4(1):275–303. https://doi.org/10.1146/annurev.clinpsy.3.022806.091358