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This is a pre print version of the following article:

Original Citation:

Availability:

This version is available <http://hdl.handle.net/2318/1535213> since 2017-01-16T19:35:20Z

Published version:

DOI:10.1002/erv.2369

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This is the author's final version of the contribution published as:

Abbate-Daga, Giovanni; Marzola, Enrica; De-Bacco, Carlotta; Buzzichelli, Sara; Brustolin, Annalisa; Campisi, Stefania; Amianto, Federico; Migliaretti, Giuseppe; Fassino, Secondo. Day Hospital Treatment for Anorexia Nervosa: A 12-Month Follow-up Study. *EUROPEAN EATING DISORDERS REVIEW*. 23 (5) pp: 390-398.
DOI: 10.1002/erv.2369

The publisher's version is available at:

<http://doi.wiley.com/10.1002/erv.2369>

When citing, please refer to the published version.

Link to this full text:

<http://hdl.handle.net/2318/1535213>

Day hospital treatment for anorexia nervosa: a 12-month follow-up study

Running head: Day hospital treatment for anorexia nervosa

Giovanni Abbate-Daga^{a*}, Enrica Marzola^a, Carlotta De-Bacco^a, Sara Buzzichelli^a, Annalisa Brustolin^a, Stefania Campisi^a, Federico Amianto^a, Giuseppe Migliaretti^b, Secondo Fassino^a

^aEating Disorders Center, Department of Neuroscience, University of Turin, Turin, Italy

^bDepartment of Clinical and Biological Sciences, University of Turin, Turin, Italy

The work was carried out at the Eating Disorders Center of the University of Turin, via Cherasco 11, 10126, Turin, Italy.

Sponsor(s): none.

*Correspondence concerning this article should be addressed to:

Prof. Giovanni Abbate-Daga

Department of Neuroscience, University of Turin – Turin, Italy

Mailing address: Via Cherasco 15 - 10126 - Turin, Italy

Tel: +39 011 6335196

Fax: +39 011 6335749

E-mail: giovanni.abbatedaga@unito.it

Abstract

Day hospitals (DHs) represent a treatment option for anorexia nervosa (AN), a difficult-to-treat mental disorder with no available evidence-based treatments. We aimed to determine the effectiveness of a DH treatment specifically focused on emotions for severe AN patients. Body Mass Index and eating psychopathology were the primary outcome.

Fifty-six AN adult patients were assessed at admission, end of treatment (EOT), and 12-month follow-up (T18) using: Eating Disorders Inventory-2, Beck Depression Inventory, Hamilton Rating Scale for Anxiety, and Brief Social Phobia Scale. All participants received a multidisciplinary treatment focused on psychodynamic psychotherapy.

Seventy-eight% of participants reported positive outcome at EOT and 68% at T18. Moreover, 82.1% and 65.4% of long-standing patients showed a positive outcome at EOT and T18, respectively. All measures of psychopathology improved significantly at EOT and were maintained at follow-up.

The DH was effective for severe AN patients; however, further investigations of the process of change are needed.

Keywords

Anorexia nervosa, eating disorders, day hospital, outcome

Introduction

Anorexia nervosa (AN) is a severe psychiatric disorder characterized by self-imposed starvation and aberrant patterns of feeding behaviors (American Psychological Association, 2013). Over the past decades day hospitals (DHs) have become an increasingly relevant therapeutic approach to AN and represent to date recommended treatments (Yager *et al.*, 2012). Since partially hospitalized patients return to their home at night and during weekends, this intervention is peculiar in several respects (Abbate-Daga *et al.*, 2009). Firstly, DHs allow patients to maintain their social relationships avoiding the isolation that hospitalizations frequently entail, mostly when lengthy as often needed in AN. For this reason, patients' daily exposure to family and peers can represent not only a source of support but also a fruitful opportunity to work in therapy on eventual environment-related maintaining factors. Secondly, patients are provided daily with a real-world feedback about those new skills and strategies that they are developing in treatment. Finally, DHs can be indicated for all those patients whose severity cannot be managed on an outpatient basis although the inpatient setting is not strictly necessary.

DHs are currently disseminated worldwide and their effectiveness is grounded in promising results as regards outcome and cost-effectiveness (for reviews see Abbate-Daga *et al.*, 2009 and Hepburn & Wilson, 2014). Nevertheless, a wide array of health care systems, treatment approaches, and definitions of outcome used across studies makes it difficult to garner solid evidence about this intensive intervention. Additionally, research on the effectiveness of DHs in AN is somehow sparse and follow-up data are lacking.

There is also a dearth of effective treatments for AN, mostly for adult patients, with substantial evidence showing that about 20% of affected individuals develop a chronic illness

and 5% die from this disorder over the course of the years (Arcelus, Mitchell, Wales, & Nielsen, 2011). An enduring course of AN represents not only a negative prognostic factor (Le Grange *et al.*, 2014) but also a daunting challenge in clinical practice (Strober, 2010) with long-standing individuals often reporting great resistance to treatments (Abbate-Daga *et al.*, 2013).

Ambivalence towards recovery is a relevant aspect of AN (Abbate-Daga, Amianto, Delsedime, De-Bacco, & Fassino, 2013) because it is often involved in hindering patients' engagement in the therapeutic process. Biological (i.e., scarring effect of emaciation; Kaye, Fudge, & Paulus, 2009) along with psychological (i.e., "adaptive" function of the disorder; Schmidt & Treasure, 2006) underpinnings could be called into question in the understanding of this phenomenon. Relatedly, difficulties in emotion regulation have been proposed to play a role in the development and maintenance of AN (Racine & Wildes, 2013) and specific treatments have recently started addressing such components (Wildes & Marcus, 2011; Abbate-Daga *et al.*, 2012) in addition to well-known psychodynamic approaches (Zipfel *et al.*, 2014).

A few lines of research have recently started focusing on treatment strategies for those patients who develop a long-standing, non-responding disorder (e.g. cognitive-behavior therapy; Touyz *et al.*, 2013) and whose needs could be greatly peculiar (Bamford & Mountford, 2012; Hay Touyz, & Sud, 2012). Although frequently needed, long-standing patients tend to refuse hospitalizations; therefore, DHs may be a feasible and more acceptable alternative in treatment. Additionally, no criteria exist on how to stage AN thus making the development of tailored interventions even more complicated; however, several authors suggested a history of illness of 7 years to be a "threshold" for enduring or long-standing eating disorder (Maguire *et al.*, 2008; Touyz *et al.*, 2013).

Given the gap in literature on partial hospitalization for patients affected by AN with this 12-month outcome study we sought to determine the effectiveness of a DH with a psychodynamic specific focus on emotions and interpersonal functioning (Abbate-Daga *et al.*, 2012). Body Mass Index (BMI) as well as eating psychopathology were considered as primary outcome and psychological functioning (i.e., depression, anxiety) as secondary outcome. Additionally, prompted by the lack of data on severe and long-standing patients, our secondary aim was to determine the outcome of a subsample of sufferers having a history of illness of at least 7 years (Maguire *et al.*, 2008). Notwithstanding the severity of the sample we expected that the DH treatment could be effective in improving the aforementioned clinical and psychopathology aspects with promising results also at follow-up.

Methods

The day hospital of Turin

Background. The DH for Eating Disorders (EDs) of the San Giovanni Battista Hospital of the University of Turin, Italy, opened in 2006 as a secondary care facility within the context of a stepped-care continuum of interventions (in, out, and day patient services). The DH is overall grounded in a thorough review of the scientific literature and international guidelines; accordingly, it relies also on a multidisciplinary approach.

The conceptual framework of our DH is psychodynamically and emotion-focused oriented with the improvement of socio-relational skills also representing a specific core of this intervention (Abbate-Daga *et al.*, 2009; 2012). Psychodynamic psychotherapy has been also recently supported by a recent RCT that found it to be as effective as CBT and superior to treatment as usual (Zipfel *et al.*, 2014) in treating AN outpatients. Treatment is delivered according to a multi-phasic design encompassing refeeding, and awareness of both emotions and meaning of illness (phase 1), normalization of eating behaviors and emotional coping (phase 2), and work on core beliefs contributing to maintain the disorder, relapse prevention, and improvement of socio-relational skills (phase 3, Gramaglia *et al.*, 2011).

As outlined elsewhere (Abbate-Daga *et al.*, 2009, 2012), the 5-day DH program is located away from the inpatient unit and it is offered from Monday to Friday from 8.30 am to 3.30 pm to a maximum of 12 patients. The duration of treatment is 6 months. The overall structure of the DH is specifically focused on the group setting to promote not only the work on eating psychopathology and psychological functioning but also on mobilizing patients' resources with respect to social interactions and relational skills.

Over the last years, the development of an integrated DH service has become increasingly pertinent to the growing number of patients with severe and enduring AN who seek treatment at our ED Program. The DH often represents a clinical response to all those patients who are severely emaciated although their medical condition does not require acute medical stabilization. Moreover, some medical interventions (i.e., EKG, intravenous refeeding and treatment of electrolyte abnormalities, etc.) are also provided in this context of care. Hence, those patients who have just been discharged from the inpatient service are typically admitted to partial hospitalization as well as those outpatients showing a deteriorated clinical condition (i.e. increase in binge-purging episodes, rapid weight loss, disruption of social relational functioning, etc.) but who still refuse hospitalization. Therefore, a large proportion of partially hospitalized patients is represented by severe, emaciated, and long-standing individuals. It is also worth mentioning that according to the Italian public health system all patients have direct access to the ED Center as indicated by their primary care physician with no exceptions due to their socio-economic or insurance status.

Intake and exclusion and inclusion criteria. The intake process is managed by the clinical director, an experienced psychiatrist who preliminary interviews all candidates. Patients' diagnosis is then confirmed by a second psychiatrist using structured interviews. Inclusion criteria are represented by a diagnosis of AN, BN, and EDNOS and age of 16 or over. Exclusion criteria are: a) acute medical risk requiring hospitalization; b) BMI<13.5; c) active substance abuse or dependence; d) psychosis or bipolar disorder; e) obesity or Binge Eating Disorder; f) suicide risk. Patients' ability to be engaged in group interventions, motivation to change (i.e., contemplation phase according to Prochaska and DiClemente (1983) is required), psychosocial functioning, and family dynamics are also carefully evaluated at this stage.

Contracting and clinical management. After the first interview, all patients are required to read carefully a standardized contract listing behavioral rules (i.e., management of supervised meals and toilets) that regulate everyday life at the DH. Later in treatment, all patients are provided also with individualized contracts aiming at engaging them in treatment planning and clearly identify clinical goals (i.e., BMI and eating psychopathology) and consequences to either progresses or difficulties.

Per NICE Guidelines recommendations (NICE, 2004), the intervention is highly multidisciplinary including psychiatrists, clinical psychologists, a registered dietitian, one internal medicine physician and psychiatric nurses.

Psychodynamic psychotherapy. This DH relies on psychodynamic psychotherapy according to a standardized model described elsewhere (Fassino, Amianto, & Ferrero, 2008; Abbate-Daga *et al.*, 2009). All patients undergo weekly 45-minute individual sessions and daily 1-hour group sessions of psychodynamic psychotherapy. The groups are composed by a maximum of 12 individuals and are run by two experienced psychiatrists with extensive psychodynamic training and expertise. The group setting has a role in mobilizing resources to enhance those skills that are necessary to achieve a more adaptive social functioning with both family and peers.

Dietetic management-meals. The dietitian has weekly sessions with all patients providing nutritional counselling and planning qualitatively and quantitatively the intakes of both week days and week-ends. Patients are weighted randomly to avoid misleading results and with a weekly frequency to avoid eventual confounders (i.e., fluid shifts during refeeding; for a review see Marzola, Nasser, Hashim, Shih, & Kaye, 2013); they are weighted in the morning, after voiding, wearing only underwear. During the DH hours, patients receive 3 structured meals (half-morning snack, lunch, mid-afternoon snack); according to specific needs, breakfast can be

also provided. Psychiatric nurses and dietitian supervise all meals although they do not eat with the patients. As agreed upon during the writing of the behavioral contract, a booster is provided if patients do not complete their meals.

Behavioral techniques. The clinical psychologist with the dietitian and a nurse run weekly a behavioral group which is specifically aimed at providing patients with a better management of their disorder. Patients are asked to complete a daily eating diary that they discuss during the group; they are encouraged to share with other participants their own difficulties during meals and to identify potential triggers of the ED symptoms. Goals and strategies for the weekend are also discussed.

Parent counselling. The clinical team offers monthly parent counselling interventions with a two-fold aim: 1. To collect information and feedback on patients' behaviors and difficulties while at home; 2. To provide parents with the necessary tools to support and encourage patients' motivation and compliance to treatments. On an individual basis, significant others are also involved.

Staff meetings and supervisions. In addition to daily communications, weekly all-staff meetings take place to update the team about patients' clinical situation and to share relevant information emerging in groups or individual settings. All clinical staff members undergo biweekly psychodynamic supervision sessions provided by an experienced psychiatrist aiming at avoid burnout, empowering the clinical team and improving the overall effectiveness of the multidisciplinary work.

Participants and measures

Participants. We enrolled in this study 56 adult patients with AN who were consecutively admitted to the DH of the ED Program of the San Giovanni Battista Hospital of the University of Turin, Turin, Italy, from September, 2009 until August, 2012. Partially hospitalized patients who were diagnosed with BN (n=8) were excluded from this study. All participants met the Structured Clinical Interview for DSM-IV Axis I and II Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1997), SCID-II (First, Gibbon, Spitzer, Williams, & Benjamin, 1997) diagnostic criteria for AN both subtypes (Restricting, AN-R, and Binge-Purging AN-BP). Those AN patients showing a Body Mass Index (BMI) over 17.5 (stepped-down after hospitalization) but with persistent eating psychopathology were considered as partially (≤ 17.5 and ≤ 18.5) or fully (≥ 18.5) weight-restored (AN-WR) patients. All patients had amenorrhea and underwent the same DH treatment we described above.

Assessment and measures. Using a naturalistic design we aimed at assessing changes in weight and overall psychological functioning at baseline (T0), end of treatment (EOT) and 12-month follow-up (T18). All the clinician-administered assessments of this study were conducted by researchers not involved in patients' clinical management. After obtaining written informed consent according to the Ethical Committee of the Department of Neuroscience of the University of Turin, all participants were assessed using self-report questionnaires at all time-points (see below). Moreover, patients' BMI was measured and all of them were interviewed in person by a psychiatrist using the SCID-I (First *et al.*, 1997).

Eating psychopathology. The Eating Disorders Inventory-2 (EDI-2; Garner, 1991) is a psychometrically robust (Thiel & Paul, 2006) self-report measure of disordered eating attitudes, behaviors and personality traits common to individuals diagnosed with an ED. Eleven subscales

evaluate symptoms and psychological correlates of the eating disorders with high scores reflecting pathology.

Depressive and anxious symptomatology. The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a self-report questionnaire with good psychometric properties (Beck, Steer, & Garbin, 1988) used to evaluate the severity of depressive symptoms and each answer is rated from 0 to 3. For people who have been clinically diagnosed, scores from 0 to 9 represent minimal depressive symptoms, scores of 10 to 16 indicate mild depression, scores of 17 to 29 indicate moderate depression and scores of 30 to 63 indicate severe depression.

The Hamilton Rating Scale for Anxiety (HAM-A) is a clinician-administered scale of anxiety severity (Hamilton, 1959). Scores range from 0 to 56 (0–7 suggest no or minimal symptoms, 8–14 mild, 15–23 moderate, and ≥ 24 severe anxiety). It showed good reliability, validity and sensitivity to change (Maier, Buller, Philipp, & Heuser, 1988).

The Brief Social Phobia Scale (BSPS, Davidson *et al.*, 1997) is a clinician-rated measure of social phobic symptoms showing good psychometric properties (Davidson *et al.*, 1997); it consists of 11 items, 7 evaluating commonly feared or avoided situations and 4 additional items measuring autonomic distress.

Outcome. At EOT outcome was considered as good, intermediate or poor as follows: 1. Good: remission criteria as proposed by Kordy and collaborators (2002): namely, BMI > 17.5, absence of binge-purging episodes, and normal scores on EDI-2 subscales 1–3 (drive for thinness, bulimia, body dissatisfaction); 2. Intermediate: increase in BMI without achievement of 17.5,

binge-purging episodes \leq 1/week, scores on EDI-2 subscales 1–3 (drive for thinness, bulimia, body dissatisfaction) within 1 SD of the norms; 3. poor: absence of improvement in either BMI, binge-purging symptoms, and scores on EDI-2 subscales 1–3 (drive for thinness, bulimia, body dissatisfaction) outside statistical norms.

At the 12-month follow-up outcome was defined as follows: 1. Good: recovery and remission as proposed by Kordy and collaborators (2002): namely, recovery: BMI $>$ 19, absence of binge-purging episodes, and normal scores on EDI-2 subscales 1–3 (drive for thinness, bulimia, body dissatisfaction); remission: BMI $>$ 17.5, absence of binge-purging episodes, and normal scores on EDI-2 subscales 1–3 (drive for thinness, bulimia, body dissatisfaction); 2. Intermediate: BMI increased when compared to EOT but still $<$ 17.5, binge-purging episodes \leq 1/week, scores on EDI-2 subscales 1–3 (drive for thinness, bulimia, body dissatisfaction) within 1 SD of the norms; 3. poor: failure to either maintain or improve BMI, binge-purging symptoms, and scores on EDI-2 subscales 1–3 (drive for thinness, bulimia, body dissatisfaction) outside statistical norms.

Eating psychopathology was assessed with both EDI-2 and SCID-I.

Statistical analysis. The sample size estimation based on the EDI-2 global score variation between T0 and T18. Assuming a standard deviation=50 and an effect $\mu_2 - \mu_1=20$ units, a total of 51 patients was requested to achieve a power of 80% with a two side alpha error=0.05.

A lost case analysis was performed to ascertain whether those who dropped out differed from the study participants as regards any baseline continuous or categorical variables using Mann-Whitney-Wilcoxon test and Fisher's exact test, respectively.

Quantitative measures were described using means, standard deviations (SD) and relative 95% confidence intervals (95% CI). Changes between different time-points were analyzed using analysis of variance (ANOVA) for repeated measure models; in order to analyze differences between time-points, a specific post-hoc analysis was performed using t-Student test for paired data, considering a properly adjusted for the multiple comparisons significance levels. The effect size of all findings was measured with the Partial Eta Squared (η_p^2). According to Cohen's work (1988) the effect size can be assessed as small $\eta_p^2=0.01-0.06$; moderate $\eta_p^2=0.06-0.14$; or large $\eta_p^2>0.14$.

Models of ANOVA for repeated measures were performed also to compare changes over the period ranging from T0 to T18 within AN diagnostic groups. The most relevant results are presented in the text.

All statistical analysis were performed using the Stata statistical software (StataCorp. Statistical Software: Release 7.0. College Station, TX: Stata Corporation. 2001).

Results

Baseline assessments

Clinical features of the sample. All patients were women and Caucasian. As regards diagnostic subtypes, 34 were AN-R and 22 AN-BP. In the latter group, baseline mean weekly bingeing episodes were 4.86 (SD=4.91) and purging episodes 9.5 (SD=14.91). Restored weight patients were 12 (n=3 AN-R and n=9 AN-BP, Fisher's exact test p=0.007).

Patients' mean age was 25.03 (SD=5.75) years, mean age at onset 17.33 (SD=3.34) years, mean duration of illness 7.8 (SD=5.34, range: 0.8-24) years. Baseline mean BMI of the whole sample was 16.31 (SD=2.66) but it dropped to 15.37(SD=0.25) if the weight-restored patients were excluded from the analysis.

Most participants showed comorbid Axis I (n=47, 83.9%) and Axis II (n=38, 67.9%) disorders; more in detail, 27 (48.2%) individuals had an anxiety and 43 (76.8%) a depressive disorder (Table 1). Moreover, the majority of patients failed previous treatments (n=42, 75%) including residential (n=5, 11.9%), outpatient (n=16, 38.1%), or combined (n=21, 50%) approaches. Finally, the majority of the sample was hospitalized during the prior year (n=40, 71.4%). For further details see Table 1.

Table 1. Baseline clinical features of the sample.

	AN (N=56)	
	N(%)	Mean(SD)
Age		25.03(5.75)
Age at onset		17.33(3.34)
Duration of illness		7.8(5.34)

BMI	16.32(2.66)
BMI (with no weight-restored patients)	15.37(0.25)
AN-R	34(60.7)
AN-BP	22(39.3)
Comorbidity Axis I	47(83.9)
Anxiety disorders	27(48.2)
Depressive disorders	43(76.8)
Comorbidity Axis II	38(67.9)
Failure previous treatments	42(75)
Hospital admissions in the prior year	40(71.4)

Legend:

BMI: body mass index; AN-R: anorexia nervosa restricting subtype; AN-BP: anorexia nervosa binge-purging subtype.

Follow-up assessments

Attrition, eating psychopathology, and outcome. Fifty patients (89.3%) completed the DH intervention with 6 (10.7%) individuals requiring a brief hospitalization (i.e., less than 21 days) while partially hospitalized. Six patients (10.7%) dropped out at EOT and 8 (14.3%) at T18; therefore, 50 patients (89.3%) were available for analysis at EOT and 48 (85.7%) were willing to participate in this outcome study 12 months after discharge. At the lost case analysis, those who dropped out did not differ from the study participants as regards any baseline demographic or clinical variables (data not shown).

As shown in Table 2, BMI significantly improved over time independently of AN subtype (group-by-time interaction: $F=3.29$, $df=2$, $p=0.08$).

Table 2. Participants' body mass index (BMI) at baseline (T0), end of 6-month treatment (EOT), and 12-month follow-up (T18).

	AN (n=56)					
	T0(n=56)	EOT(n=50)	T18(n=48)	Test statistics		
	Mean(SD)	Mean(SD)	Mean(SD)	F(df=2)	p	η_p^2
	[95% CI]	[95% CI]	[95% CI]			
BMI	16.32(2.66)	17.30(2.53)	17.28(2.74)	5.44	0.006	0.11
	[15.62 to 17.02]	[16.6 to 18.0]	[16.5 to 18.05]			

Means(standard deviations) and 95% confidence intervals (95% CI) are presented. Test statistics are ANOVAs for repeated measures. η_p^2 = Partial Eta Squared; Cohen's effect size: 0.01-0.06=small effect; 0.06-0.14=moderate effect; >0.14=large effect.

At EOT, 9 patients (18%) were found to have good, 30 intermediate (60%), and 11 (22%) poor outcome whilst at T18 16 patients (33.3%) showed good (including 7 recovered individuals, 14.6%), 17 intermediate (35.4%), and 15 (31.3%) poor outcome (see Figure 1).

-----INSERT FIGURE 1 ABOUT HERE-----

With regard to eating psychopathology the majority of EDI-2 subscales (with the exception of ineffectiveness, perfectionism, maturity fears, and impulse regulation) improved

significantly over time. When compared to EOT, these results were overall maintained at T18 (data not shown) with the exception of interpersonal distrust and asceticism (paired-sample t-test: $t=2.77$; $p=0.008$ and $t=2.17$; $p=0.035$, respectively) that were further improved at the follow-up assessment. AN-R and AN-BP scored differently only on the asceticism subscale (group-by-time interaction: $F=4.19$, $df=2$, $p=0.02$).

Table 3. Participants' clinical features at follow-up upon admission (T0), end of treatment (EOT), and 12-month follow-up (T18).

	AN (n=56)			Test statistics					
	T0 (n=56)	EOT(n=50)	T18(n=48)	Main effect of time			Group-by-time interaction		
	Mean(SD)	Mean(SD)	Mean(SD)	F(df=2)	p	η_p^2	F(df=2)	p	η_p^2
EDI-2 total score	107.03(55.11)	89.14(51.09)	85.02(59.79)	8.08	0.001	0.15	1.17	0.31	0.03
DT	13.57(7.24)	11.12(7.33)	10.37(7.40)	4.91	0.009	0.10	1.36	0.261	0.03
B	5.51(5.98)	4.5(5.78)	3.95(5.72)	6.13	0.003	0.12	2.31	0.106	0.05
BD	16.25(7.19)	13.5(8.44)	12.60(8.08)	6.35	0.003	0.13	0.79	0.458	0.02
I	12.98(8.11)	10.54(7.31)	10.85(9.40)	1.83	0.17	0.04	0.09	0.911	0.01
P	6.41(4.52)	5.8(4.38)	6.25(4.49)	0.83	0.44	0.02	1.24	0.296	0.03
ID	7.35(5.46)	6.76(4.53)	5.83(4.46)	5.99	0.004	0.12	0.52	0.594	0.01
IA	11.51(8.07)	9.74(7.88)	8.87(8.90)	3.82	0.026	0.08	0.71	0.498	0.02
MF	8.01(6.63)	6.54(5.59)	6.16(6.40)	2.81	0.065	0.06	0.53	0.588	0.01
A	8.35(6.15)	7.06(4.70)	6.27(5.41)	8.09	0.001	0.15	4.19	0.018	0.09

IR	7.05(6.54)	5.82(6.04)	6.31(7.08)	2.37	0.10	0.05	1.93	0.152	0.04
SI	10(6.39)	7.76(4.32)	7.52(5.63)	7.58	0.001	0.15	0.51	0.605	0.01
HAM-A	20.41(2.62)	11.54(2.24)	7.81(3.34)	461.50	<0.001	0.91	0.14	0.865	0.01
BDI	17.09(8.7)	12.55(8.11)	12.31(9.62)	9.36	<0.001	0.18	1.29	0.283	0.03
BPSP	37.16(12.66)	26.42(9.66)	22.81(10.30)	71.46	<0.001	0.61	0.35	0.708	0.01

Means(standard deviations) are presented. Test statistics are ANOVAs for repeated measures. Significant results are highlighted in bold. η_p^2 = Partial Eta Squared; Cohen's effect size: 0.01-0.06=small effect; 0.06-0.14=moderate effect; >0.14=large effect.

Legend: EDI-2: Eating Disorders Inventory-2; DT: drive for thinness; B: bulimia; BD: body dissatisfaction; I: ineffectiveness; P: perfectionism; ID: interpersonal distrust; IA: interoceptive awareness; MF: maturity fears; A: asceticism; IR: impulse regulation; SI: social insecurity; BMI body mass index; HAM-A: Hamilton Rating Scale for Anxiety; BDI: Beck Depression Inventory; BPSP: Brief Social Phobia Scale.

Anxious and depressive symptomatology. As regards anxiety as measured by the HAM-A the diagnostic subtypes did not differ (group-by-time interaction: $F=0.14$, $df=2$, $p=0.86$) and significant improvements were reported on the HAM-A at the different time-points considered. At T18 the HAM-A scores were found to be further improved when compared to EOT (paired-sample t-test: $t=8.16$; $p<0.001$). Social anxiety was significantly reduced over time with no differences between subgroups (Table 3) and scores at T18 were significantly lower when compared to EOT (paired-sample t-test: $t=2.7$; $p<0.001$).

With respect to depressive symptomatology, significant improvements were reported in both AN-R and AN-BP subgroups (Table 3).

Long-standing patients' outcome. Considering as long-standing those patients with at least 7 years of history of illness [$n=31$, 55% of the sample, duration of illness: 11.66 (SD=3.34) years], we found that the vast majority of them ($n=28$, 90.3%) completed the DH intervention and that 26 (83.9%) were available for the T18 assessment. At EOT, 3 (10.7%) were found to have good, 20 (71.4%) intermediate, and 5 (17.9%) poor outcome whilst at T18 7 (26.9%) showed good ($n=1$ achieved recovery, 3.8%), 10 (38.5%) intermediate, and 9 (36.4%) poor outcome (Figure 2). Those with a long-standing disorder were significantly less likely to be found as recovered than those with shorter duration of illness (Fisher's exact test $p=0.038$).

-----INSERT FIGURE 2 ABOUT HERE-----

Discussion

Scientific literature on DHs for AN is lacking and studies dealing with the additional challenge of severe patients (i.e., low BMI, high comorbidity, hospitalizations during the prior year) are even poorer. With the overarching aim of filling this gap, we became interested in assessing the effectiveness of a DH for severe patients with AN who largely (75% of the sample) failed to respond to previous treatments.

The findings generated by this study are multifaceted and overall confirming our a priori hypothesis. In fact, as regards the primary outcome of this study, a reason for optimism is that 78% of patients showed a positive outcome substantially maintaining (68%) this result at follow-up; remarkably, the proportion of good outcome overall increased 12 months after discharge. Likewise, several EDI-2 subscales significantly improved with moderate to large effect size, especially those related to eating and body psychopathology and this is promising since these aspects tend to be crucial for the course of AN (Carter *et al.*, 2012). Finally, a number of cases achieved recovery at follow-up. However, it should be also acknowledged that 22% of the sample failed to respond to treatment and the BMI increase was overall modest. Additionally, intermediate outcome was highly represented at both time-points; on one hand this is an encouraging result but on the other hand it may also represent a slippery slope towards relapse.

Regrettably, a direct comparison of these findings with previous literature is made difficult by the wide array of methodological differences found in literature. Definition of outcome varies broadly along with duration of both partial hospitalization and length of follow-up, if any. Moreover, clinical information including duration of illness and failure of previous therapeutic attempts is only seldom provided. Still, our work introduces a few novel elements like the inclusion and assessment of severe and resistant patients coupled with a 12-month

follow-up. In spite of such variability, DH treatments are reported to have positive outcomes at EOT varying between 30% (Zeeck, Herzog, & Hartmann, 2004) and 63% (Williamson, Thaw, & Varnado-Sullivan, 1998) whilst at follow-up positive outcomes were reported in about 50% of cases (Fittig, Jacobi, Backmund, Gerlinghoff, & Wittchen, 2008; Treat, McCabe, Gaskill, & Marcus, 2008). Notwithstanding the aforementioned generalizability caveat, our findings result overall in line with those in literature and are of particular interest since we considered a long-standing and treatment-resistant (75% of cases) sample.

These outcome results are overall comparable with other interventions for severe AN. For example, the Maudsley Model for Treatment of Adults with anorexia nervosa (MANTRA, Schmidt *et al.*, 2012) intervention showed a similar proportion of outpatients who achieved recovery according to a BMI criterion at EOT. It should be also acknowledged that the sample of this study largely failed to meet those criteria that have been consistently found to be associated with favorable outcomes like short duration of illness (Eisler *et al.*, 1997), and high motivation (Zeeck *et al.*, 2004).

With respect to the secondary aim of this study, we found a significant improvement in anxious and depressive symptomatology with large effect sizes. Anxiety disorders can be entrenched with AN as regards both course and treatment. In fact, a lifetime anxiety disorder has been found in up to 83% of AN individuals (Godart, Flament, Lecrubier, & Jeammet, 2000) and anxious traits seem to persist after recovery (Kaye, Bulik, Thornton, Barbarich, & Masters, 2004). Fear of negative evaluation and avoidance of emotional recognition and expression are common traits in AN and have also recently been argued to be strictly related with social anxiety (Arcelus, Haslam, Farrow, & Meyer, 2013). The latter is common condition in AN with a lifetime prevalence between 20 and 55% (Godart *et al.*, 2000) and it is an element of keen

interest in clinical practice. In fact, it may impact the therapeutic relationship given the relevance of social interactions in the context of care possibly hampering patients' engagement in treatment and contributing to their dismissive attitude (Clark, 2002). Confirming our a priori hypothesis, we found that this psychodynamically informed DH with a specific focus on emotions and relational skills resulted effective in improving social anxiety and more in general psychological functioning at both time-points. Data from this study are overall in line with other therapies focused on emotion avoidance and socio-relational aspects (Ohmann *et al.*, 2013).

In spite of the relevance of emotional awareness and coping and relational aspects as regards both development and maintenance of AN (Arcelus *et al.*, 2013) only a handful of studies performed their assessment over time (Hartmann, Zeeck, & Barrett, 2010; Ohmann *et al.*, 2013) leading to results comparable to those of this work. Interpersonal relationships are the core of psychodynamic therapies (Zipfel *et al.*, 2014) which also encourage the experience of those emotions that patients previously tended to avoid (Holmes, 2012). However, given the overall illness severity of these patients, an individual approach is also undertaken, in line with recent literature (McFarlane, MacDonald, Trottier, & Olmsted, 2014). As previously proposed (Zipfel *et al.*, 2014) these aspects of psychodynamic therapy may contribute to the positive effects of treatment in these patients and eventually also to the low dropout that we reported in our study.

Changes in BMI were modest with moderate effect size but this is in line with other works showing that day hospitals tend to be less effective in weight gain than inpatient treatments (Goddard *et al.*, 2013); however, the severity of the sample and more in detail of baseline BMI should be also taken into account when considering this aspect. Given that a BMI lower than 19 has been shown to be a negative predictor for DH treatments (Howard, Evans, Quintero-Howard, Bowers, & Andersen, 1999) the reported improvement at EOT and its

maintenance at follow-up is of importance. In fact, for many patients the achievement of complete weight restoration over a few-month period of time is beyond the realm of possibility (Strober, 2010; Touyz *et al.*, 2013). Nonetheless, this should not preclude therapists to engage them in treatment and set shared and safe goals (Bamford & Mountford, 2012) which should be carefully matched to patients' readiness to change (Touyz, Thornton, Rieger, George, & Beumont, 2003). Inoltre

In line with previous literature (Eisler *et al.*, 1997; Le Grange *et al.*, 2014) data from this study showed that long-standing patients are less likely to achieve recovery. Such finding should pave the way to the development of early interventions and to tailored therapies for those who are characterized by an enduring illness (Hay *et al.*, 2012). If the latter is the case, dynamic psychotherapy with its focus on emotive and relational aspects could represent a suitable treatment option, as future studies will need to clarify.

This work has several strengths like the naturalistic design thus assuming high external validity and the involvement of patients who are particularly challenging to treat in everyday clinical practice. However, some limitations should be acknowledged: the sample size was relatively small, the DH treatment lacked effectiveness in a number of cases, and a longer follow-up is warranted. Finally, also given the well-known difficulties in conducting RCTs with AN patients (Halmi, 2008), there was no control group.

In closing, the DH intervention provided support to the effectiveness of a psychodynamic approach to individuals affected by severe or long-standing AN as a priori hypothesized. The dynamic interventions and the therapeutic challenge of socialization provided by the DH could enhance these aspects. Further research is needed not only to confirm these results but also to

generate new ideas on how to stage this disorder and find appropriate goals for long-standing individuals.

Acknowledgments

None.

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