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Alternatives to inpatient treatment in adolescents with anorexia nervosa: Effectiveness and characteristics of a new intensive model of day patient treatment

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Introduction. Inpatient Treatment (IT) is the treatment of choice for moderate or severely ill adolescents with Anorexia Nervosa (AN). Nevertheless, it is expensive, and the risk for relapse or readmissions is high. A less costly alternative to IT is Day Patient Treatment (DP), which may also help to avoid relapses and readmissions because facilitates transition from hospital to community treatment.

Aim. To assess the effectiveness of the 11-hour DP program for Eating Disorders (DP-ED-11h), a new intensive DP treatment for adolescents with AN, with respect to weight recovery, avoidance of hospital admission and decrease of Length of Stay (LoS).

Method. A longitudinal, naturalistic study was carried out analysing clinical and sociodemographic variables from 77 patients with AN who were consecutively discharged from DP-ED-11h, during years 2015-2016.

Results. There were 77 discharges. The average age was 14.4 years old (SD: 1.62). The LoS at DP-ED-11h was 28.9 days (SD: 18.5). The mean body mass index increased significantly at discharge (17.2 vs. 17.9, p<0.001) and at 12 months follow-up (17.9 vs. 19.3, p<0.001). Twenty nine (70.8%) of the patients treated at DP-ED-11h, who came from a less intensive setting, avoided an admission. Fourteen (18.2%) required readmission at DP-ED-11h within two years. The LoS at IT was significantly reduced (from 33 to 24 days, p<0.043).

Conclusion. DP-ED-11h has shown to be an effective resource as an alternative to IT for adolescents with moderate to severe AN. This new model has cost-effectiveness implications as it is a safe resource and is less costly than IT.

Keywords: Anorexia nervosa, Day patient treatment, Adolescents, Effectiveness, Treatment Outcome

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Alternativas a la hospitalización total en adolescentes con anorexia nerviosa: Eficacia y características de un nuevo modelo intensivo de tratamiento en hospital de día

Introducción. La Hospitalización Total (HT) es el tratamiento de elección para adolescentes con Anorexia Nerviosa (AN) moderada-grave. Sin embargo, ésta es costosa y el riesgo de recaída o reingresos es alto. Una alternativa menos costosa es la Hospitalización Parcial (HP), que puede ayudar a evitar recaídas y reingresos porque facilita la transición del hospital al tratamiento comunitario.

Objetivo. Evaluar la eficacia de un tratamiento intensivo en HP para adolescentes con AN, el programa de HP para Trastornos de la Conducta Alimentaria (TCA) de 11 horas (HP-TCA-11h), respecto a la recuperación ponderal, evitar ingresos y disminuir estancias en HT.

Método. Se realizó un estudio longitudinal y naturalístico que analizó las variables clínicas y socio-demográficas de los pacientes con AN que fueron dados de alta consecutivamente del HP-TCA-11h, durante los años 2015-2016.

Resultados. Se realizaron 77 altas. La edad media fue de 14.4 años (DE: 1.62). La estancia media fue de 28.9 días (DE: 18.5). La media del índice de masa corporal aumentó significativamente al alta (17.2 frente a 17.9, p<0.001) y a

los 12 meses de seguimiento (17.9 frente a 19.3, p<0.001). Veintinueve (70.8%) pacientes tratados en HP-TCA-11h, que vinieron de un recurso menos intensivo, evitaron el ingreso en HT. Catorce (18.2%) requirieron un reingreso en HP-TCA-11h en dos años. La estancia media en HT disminuyó significativamente (de 33 a 24 días, p<0.043).

Conclusión. HP-TCA-11h ha demostrado ser un recurso eficaz como alternativa a la HT para adolescentes con AN moderada-grave. Este nuevo modelo tiene implicaciones coste-efectivas ya que es un recurso seguro y menos costoso que la HT.

Palabras clave: Anorexia nerviosa, Hospital de día, Adolescentes, Eficacia, Resultados del tratamiento

INTRODUCTION

Anorexia Nervosa (AN) is a psychiatric condition which commonly has its onset during adolescence, a crucial period for the development both physical and mental. In terms of the evolution and prognosis of AN, it has been described that less than half of patients fully recover from the illness[1]. In addition, AN is a severe disorder, as it has the highest rate of mortality amongst all psychiatric illnesses[2]. Therefore, it is required a specific age-appropriate treatment.

Traditionally, treatment interventions for patients with AN have been offered to take place in two different clinical settings: either in an inpatient or in an outpatient service. Inpatient Treatment (IT) is the most indicated context for adolescents with AN who are suffering moderate or high physical risk due to the eating disorder[3,4]. IT is also the preferred option when patients who have not improved after being treated in an outpatient service[3,5,6]. In that sense, IT is an intensive and effective treatment mainly for refeeding and weight restoration. However, some disadvantages of IT have been previously underlined such as: it is an expensive treatment which has an impact on the national health service budgets[7]; as an inpatient setting, the medical environment where the patients are placed is very different from their natural context, making it difficult to generalize the eating patterns after discharge to outpatient care. As a consequence, it has been reported that those patients with AN directly discharged from IT to outpatient care, show a high risk of symptoms recurrence in a short term period leading to inpatient unit readmissions[8].

As a result, efforts have been done to develop an alternative treatment modality to traditional outpatient and inpatient treatment: the Day Patient treatment (DP)[5]. Some studies have evaluated the different settings of AN treatment and have recommended an implementation of the DP approach as it is a less costly option compared to IT and it also can be considered safe in terms of addressing the organic risks[9]. Apart from the economic advantage, DP offers patients an intensive treatment within a clinical setting but at the same time allows to keep them involved into their natural context and social network. On one hand, this helps to maintain the social link of the adolescents with their communities, enhancing the motivation to regain their premorbid functioning. On the other hand, it allows a higher involvement of the families, directly participating and engaging in treatment and, as a result, making it easier to transfer the skills learnt through DP to their everyday life[9,10]. In that sense, DP could be considered a helpful resource to accomplish a satisfactory transition from hospital to the community[11], attenuating the risk of relapse and readmission.

DP treatment for AN typically offers a structured eating disorder program on weekday afternoons (6 hours per day, 5 days per week). It usually includes 3 meals: lunch, an afternoon snack and dinner. However, there is a remarkable difference of treatment intensity between IT (24 hours a day, 7 days a week: 168 hours a week) and DP (6 hours a day, 5 days a week: 30 hours a week). Taking this aspect into account, a new Day Patient Treatment program for adolescents with Eating Disorders has been established at the Hospital Sant Joan de Déu of Barcelona (Spain), which lasts 11 hours a day (DP-ED-11h). It offers treatment from 8:45 to 7:45pm on weekdays. One morning a week, patients attend their community school in order to keep contact with their peers and maintain their social network. The patients admitted are children and adolescents under 18 years old, and they are diagnosed mainly with AN but also bulimia nervosa (BN), other specified feeding or eating disorder (OSFED) or avoidant/restrictive food intake disorder (ARFID). With this new DP program, a more intensive treatment is offered compared to other DP treatments, but at the same time it allows patients to keep their social and family context.

In the scientific literature, eating disorders DP treatment programs have shown to have advantages over traditional IT in financial and clinical terms[12-14]. However, most of the studies are focused on assessing the cost-effectiveness of DP interventions[9,15,16] and less is known about the clinical effectiveness in adolescents, generally lacking in follow-up evaluations[10,12]. Additionally, a wide range of DP programs has been described across studies, involving different conceptualizations and treatment perspectives, health care systems and outcomes. All these aspects, make it difficult to have a clear sense of the real DP effectiveness as an intervention for AN in adolescents[13,15].

To our knowledge there is no other study reporting information about a DP intensive AN program as such presented in our hospital. Thus, the current study, aims to assess the clinical and cost effectiveness of a new intensive treatment for adolescents with AN, the 11-hour Day Patient Treatment program for Eating Disorders (DP-ED-11h), as an alternative to IT or as a resource to continue the treatment after IT discharge, enabling the reduction of the Length of Stay (LoS) at hospital.

Our main hypothesis is that DP-ED-11h will show to be an effective resource for adolescents with moderate to severe AN both clinically (weight restoration) and economically (avoiding inpatient admissions and reducing the LoS); and this clinical improvement will be maintained at follow-up. We hypothesize that the Body Mass Index (BMI) of patients attending the DP treatment will increase significantly when comparing the initial BMI to the discharge BMI and BMI at 12 months follow-up. The second hypothesis is that DP-ED-11h will avoid inpatient admissions in approximately two third of the cases, considering that a percentage of patients will need more intensive treatment (IT) due to the severity of some of their symptoms such us very low weight at admission, low readiness to recover or very early onset of AN, that are factors associated to IT. Finally, we also hypothesize that there will be a significant decrease in the LoS in those cases in which IT is needed.

METHODS

Design

A longitudinal, naturalistic study was carried out including adolescents under treatment in the Eating Disorder (ED) Unit of a paediatric hospital.

Participants and procedures

Data for the present study came from 77 children and adolescents diagnosed with AN who were receiving the DP-ED-11h treatment at the Eating Disorder Unit at Sant Joan de Déu Hospital of Barcelona (Spain), between January 2015 and December 2016. Patients were referred to the ED Unit from primary care providers, psychiatrists and psychologists from the community or from a more intensive level of care, including day hospital and inpatient treatment facilities. Criteria for admission to DP-ED-11h conformed to the NICE guidelines recommendation to DP[3,4]. As an inclusion criteria, patients had to have received a main diagnosis of AN according to the DSM-5 criteria[17] based on the clinical judgment of a clinical psychologist or psychiatrist specializing in ED. If patients were medically unstable at the time of assessment, they were referred to a higher level of care, being admitted to the psychiatric adolescent inpatient unit located at the same hospital, which has also a specific ED program. No other exclusion criteria were applied to the current study sample.

Consecutive DP-ED-11h discharges of patients referred during these 2 years were analyzed regarding variables of age, sex, type of AN according to DSM-5[17], LoS, BMI progression (initial, discharge and 12-month follow-up BMI) and percentage of readmissions during this two year period. The average LoS of AN patients in IT from years 2013-2014 was compared to the one obtained in 2015-2016, when the new day patient treatment program (DP-ED-11h) was implanted. In that way, we could measure a hypothetical change in the LoS in our IT unit attributable to the program new structure.

A standardized assessment of comorbid psychiatric disorders was conducted at the time of admission at DP based on the clinical judgment by the same clinical psychologist or psychiatrist.

Program description

In our public ED unit we treat children and adolescents with eating disorders until the age of 18. Treatment is based on a multidisciplinary approach that combines biological management, nutritional rehabilitation, a behavioral program aimed at improving eating patterns and weight, individual and group cognitive treatment, and individual and group parent counselling. We offer treatment in three different settings: outpatient, DP treatment and IT. Patients with good treatment compliance, who do not have biological or psychological risk, benefit from the outpatient service. If weight restoration and eating behavior do not improve, patients are referred to either the day hospital for treatment or are admitted to the psychiatric inpatient unit. IT is also indicated if physical health is severely compromised or due to interference of comorbid psychopathology.

Additionally, the DP treatment setting is divided in three different subprograms according to the intensity of the intervention. The less intense level is a one-day-a-week treatment for 6 hours. If patients need a more intense treatment, the next level would be 25 hours a week intervention, coming daily on weekdays from 3pm to 8pm. The most intense subprogram is the DP-ED-11h, which is the focus of the present study and, for that reason; more details will be described below. A maximum of 10 patients can be treated at any one time at each subprogram.

DP-ED-11h is an intensive DP treatment program for children and adolescents with ED (although in this study we will only focus on the efficacy of program in patients with AN). The schedule is from 8:45 am to 7:45 pm Monday to Friday. Before the implementation of this new resource, patients being treated using DP-ED-11h would have been admitted to IT when DP treatment consisting on a 25 hour a week intervention failed. As in other DP treatments, the team involved in the program includes professionals from multiple disciplines including: nurses, psychologist, psychiatrist, social worker, occupational therapist, teacher, paediatric gastroenterologists. Thus multidisciplinary treatment includes individual and group therapy, parents group (multifamily and psychoeducation group) and nutritional advice, among other therapeutic activities. The program ensures all of the main meals, 4 a day, and controls binge eating as well as compensatory behaviors. One of the main novelties, a part from the extended schedule, is that it also provides the possibility of programming weekend meals at the hospital when patients are too severe or are struggling to follow the meal plans at home.

All patients attending the DP are assessed by a pediatric gastroenterologist-nutritionist who determines their expected body weight (EBW), based on the review of their personal weight and height evolution. The diet offered at the DP treatment is adjusted to age. Weight progress is assessed weekly, and dietary plans are adjusted to help restore weight as needed. All patients are medically monitored measuring their vital signs three times a week. Blood tests and other medical complementary tests are performed if needed.

Measures

Body mass index

Height and weight measured at admission and weight measured at discharge were used to calculate BMI (kg/m2) at these two time points. BMI at follow-up was calculated from records of outpatient sessions. BMI has been used as an objective measure of ED progress[3,5,12]. We have measured it at admission, discharge and 12 months follow-up.

Discharge Criteria of the program

At DP-ED-11h program, the main criteria for discharge are to reach and maintain 90% of the EBW (for at least two consecutive weeks), without fasting, bingeing, or purging episodes. We supervise it using food registers that parents fill in and clinical interviews with the patient and the family. If patients are having a good evolution (eating habits normalization, absence of compensatory behavior, social and emotional adjustment, appropriate progressive school reincorporation), treatment is tapered, beginning with having more mornings off, so they can attend school progressively. After, they can have one or more days off (before the definitive discharge of the DP-ED-11h), until they are transferred to a lower intensity subprogram from the day patient treatment.

The criteria to be transferred to an inpatient unit are defined in advance: medical instability, weight gain of less than a median of 700 g per week during two months, vomiting more than twice a day for more than a week, and suicidal risk as assessed by treating psychiatrist or psychologist.

Ethics

This study was carried out in accordance with the latest version of the Declaration of Helsinki. The Ethics Committee of Sant Joan de Déu Hospital (Barcelona, Spain) approved the study, and signed informed consent was obtained from all final participants.

Statistical Analysis

Data were analyzed with SPSS v.22. Parametric statistical Student's *t* test was used to compare the mean of BMI progression at discharge and at follow-up 12 months later. Also we used Student´s *t* test to assess the comparison of mean in LoS between inpatient treatment during years 2013-2014 and 2015-2016.

RESULTS

Characteristics of the sample

During this 2-year-period there were 77 discharges from DP-ED-11h. Of the total sample, 93.5% (n=72) were females and 6.5% (n=5) were males. The mean age was 14.4 years (SD: 1.62) with a range between 11 to 17 years. With regards to the type of AN, 72 (93.5%) were restrictive and 5 (6.5%) purgative. Twenty-one (27.3%) patients with AN had comorbidity with another psychiatric disorder. In particular, 9 (42.9%) had an anxiety disorder, 7 (33.3%) depressive disorder and 5 (23.8%) individuals had dysfunctional personality traits. Twenty eight (36.3%) patients received psychopharmacological treatment. Of the total of pharmacological prescriptions, 25 (32.5%) were selective serotonin reuptake inhibitors (SSRIs), 25 (32.5%) benzodiazepines and 27 (35%) neuroleptics. Of the female patients, 63 out of the 72

(87.5%) presented amenorrhea. The mean months since onset of disorder was 13.72 (SD: 9.47) and the mean duration from beginning treatment was 6.42 months (SD: 8.24). Thirty six (46.8%) patients had familiar antecedents of mental disorders, 13 of whom (36.11%) were ED.

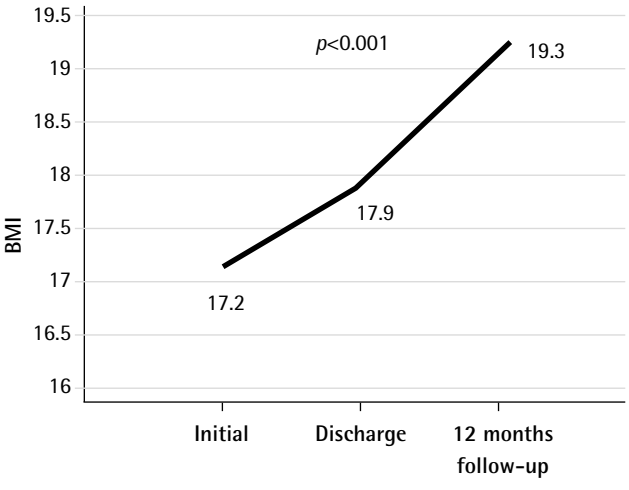
Of all these patients, 36 (46.75%) had received treatment at IT before being admitted at DP-ED-11h, and the remaining 41 (53.25%) had received less intense ED treatment including those in DP or outpatient treatment.

Thirty-six patients (46.75%) required to attend the hospital also during the weekend to have the main meals (lunch or dinner) due to difficulties in following the intake plan at home. The average number of times patients required to attend the hospital during the weekend to have lunch or dinner was 3.54 (SD: 3.13).

The average LoS in DP-ED-11h was 28.9 days (SD: 18.5).

Effectiveness of the resource: weight recovery

In terms of effectiveness, the BMI increased significantly comparing the initial BMI at the one obtained at discharge (17.2 vs. 17.9, p<0.001). It was also the case when comparing BMI at discharge and after 12 months follow-up (17.9 vs. 19.3, p<0.001) in 70 of the 77 patients (90.9%) (Figure 1).



p Student's *t* test

Figure 1 — *Body Mass Index (BMI) progression at admission, discharge and at 12 months follow-up*

Effectiveness of the resource: avoiding admissions

Of patients who were not referred directly from an inpatient unit (n=41), it was possible to avoid an impatient admission for 29 cases (70.8%) as they were able to achieve the therapeutic objectives being at the DP-ED-11h treatment. These objectives corresponded to our setting discharge criteria previously described, which required reaching 90% of the EBW and maintaining it during two consecutive weekly weight control. This weight restoration had to come together with the absence of fasting, bingeing, or purging episodes over two weeks (Figure 2).

Within the first two years, 14 (18.2%) patients who had been discharged from the DP-ED-11h required a readmission to the same setting.

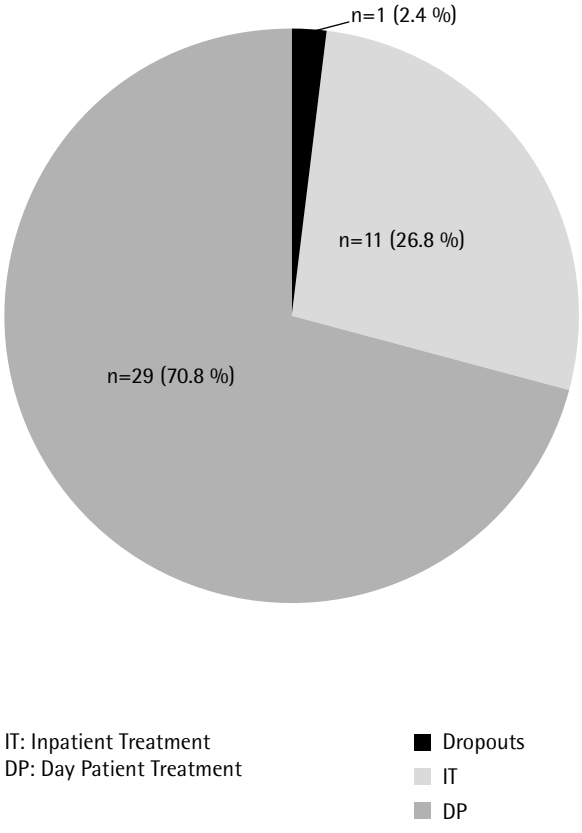
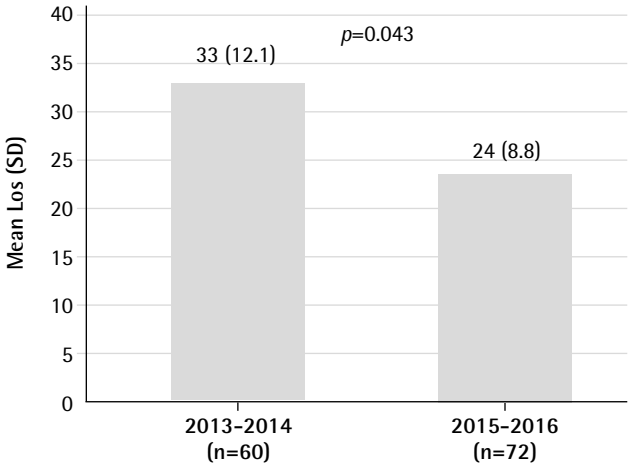


Figure 2 — *Derivation after hospital discharge of patients from DP-ED-11h, who had its come from less intensive resources (n=41)*



p Student's t test
SD: Standar Deviation
LoS: Length of Stay

Figure 3 | *Comparison of mean length of stay (LoS) in inpatient treatment during 2013-2014 and 2015-2016*

Effectiveness of the resource: reducing length of stay

The average LoS at IT decreased significantly from 33 to 24 days (p=0.043) since the implantation of the DP-ED-11h. This result corresponds to a 27.3% decrease in LoS at IT (Figure 3).

Attrition

Of all the participants, one patient (1.3%) dropped out of the resource, 76 (98.7%) completed the DP treatment until they were discharged.

DISCUSSION

The present study sought to examine treatment outcomes for adolescent patients diagnosed with AN in a specific DP treatment for ED using a naturalist design. To our knowledge, this is the first time that a specific high intense DP program like the DP-ED-11h has been described and assessed their effectiveness in terms of avoiding IT and reducing LoS. Our main results show that the DP-ED-11h program is a clinically and cost-effective resource as an alternative to IT for adolescents with moderate to severe AN.

Our findings are consistent with other studies reporting the clinical effectiveness of DP programs with regards to weight gain and reduction of eating disorder symptoms in an adolescent population with AN[10,18-22]. However, the comparison with previous literature about this topic is difficult due to the methodological differences between them, for example when defining the main outcomes, the duration of DP treatment and the length of follow-up (if any). Moreover, key clinical information, such as the illness duration and the treatments previously received, is hardly ever provided[15].

According to our results, our new DP-ED-11h program has several key findings with clinical implications worth to highlight.

First of all, it has been seen that this new model has cost-effective implications as it is a safety resource and is less costly than inpatient treatment. The DP-ED-11h program was set in 2015 in Hospital Sant Joan de Déu of Barcelona (Spain). Before setting it up, patients with AN severity as the ones attended at DP-ED-11h, would have been treated in the inpatient unit. In that sense, our results show that 7 out of 10 patients treated in the DP-ED-11h have not needed and admission avoiding IT; and of those already hospitalized, the program has provided a 9-day reduction (27.3%) in the average LoS. This result should be considered with caution as other variables may have also contributed to therapeutic gains. The avoidance of IT, in favor of DP treatment, and the decrease of LoS have allowed optimizing the management of the inpatient unit, favoring the entry of other patients who require a psychiatric admission. Thus, it has helped to reduce the inpatient unit waiting list, as well as the frequency of emergencies department consultations of these patients who now have a wider support at the day hospital.

Considering our outcomes, 3 out of 10 patients treated in our DP-ED-11h needed admission to IT. Other studies have showed similar admission rates compared to our DP program, from 35.7%[10] to 22.7%[22]. One of the advantages of our program compared to others with similar admission rates is the decrease in treatment duration at the day hospital. The LoS (28.9 days) is lower when compared to the one reported for other programs [200.4 days[23]; 81.9 days[24]] and comparable to others [33.3 days[21]]. Again, this has clinical and cost-effectiveness advantages. In addition, within the first two years of DP-ED-11h program functioning, 18.2% of the patients were readmitted to DP-ED-11h. This is a slightly lower rate compared to other studies addressing hospital readmission in a period between 12-18 months after discharge[9,25,26].

Secondly, in addition to financial benefits, DP-ED-11h has appeared to be clinically effective. On one hand, healthy body weight restoration is one of the key aims in the treatment of AN[3,5,27]. Thus, weight gain and also its maintenance after an intensive intervention have been shown to be crucial prognostic factors in patients with AN[28,29]. In our study, body weight of AN patients was not only increased at DP program discharge but also significantly increased after 12-months outpatient follow-up. Similarly, Herpertz-Dahlmann et al.[9] found that adolescent patients with AN who attended a DP treatment maintained weight at 12-month follow-up. In our study, the majority of patients continued their treatment after DP-ED-11h program as outpatients within the same service - Eating Disorders Unit of Hospital Sant Joan de Déu (Barcelona). This allowed the retrospective collection of the follow-up data in 70 (90.9%) patients at 12 months and at discharge from the outpatient service.

On the other hand, as a day hospital and in contrast with IT, this new resource gives a time and space for patients to work on rebuilding their self-confidence and to increase their autonomy as adolescents. The program described occurs in a group setting most of the time, so that also tends to enhance patient's social skills, a crucial aspect to take into account as it has been described that AN patients can struggle with it[11]. As patients in our DP program, although receiving an intensive treatment, are still living and involved in their natural environment, for example by attending school at least one morning a week, the transfer of therapeutic improvements from the clinical setting to the natural context is promoted. Then, it allows an immediate generalization of the skills learned at the day hospital to their community[12].

With regards to family involvement, some studies have suggested that in the treatment of adolescents with eating disorders it can have an important role as a facilitator of the weight gain process and its maintenance[20,30-32]. The DP-ED-11h program tries to engage parents and other main carers to help them with putting in practice at home the eating pattern recommendations given by the professionals. It also tries to empower them in the management of disrupted eating behaviors, which may occur mainly on weekends.

Another important result that emerges from the study is the very low attrition. In our study, only one patient (1.3%) did not complete the treatment. This outcome is relevant when taking into account two of the main characteristics of ED: the low readiness to recover[33,34] and the resistance to treatment[35]. These features are also associated with a higher number of hospitalizations and readmissions[36]. For this reason, it is key the engagement and the therapeutic alliance, for example adjusting the program to the patient's age and trying to involve and empower their parents. In that sense, it is important to highlight that in our DP-ED-11h program, practically all patients, despite the intensity and contingencies, completed the treatment, which shows a high level of commitment to the program by both patients and their families. Considering the rates of treatment completion reported in other studies[10,37], the number of drop-outs in our program is notably low.

These findings should be considered in light of the study's limitations. First, although the importance of weight restoration and ongoing weight gain in the treatment of AN has been well established[3,5,12,27], it would had been interesting to include other measurements to analyze the effectiveness of the program apart from weight recovery, such as evaluating body image, self-esteem or comorbid symptomology. Second, the relatively modest sample size, which reduces the power to demonstrate effects. Third, the absence of a control group together with the short-term follow-up, which makes it difficult to generalize our results. Finally, the socio-demographic characteristics of our sample included a narrow representation of the Spanish population. Thus, our findings should be generalized to other regions with appropriate caution. However, although randomized control trials are the "gold standard" to test treatment efficacy, evaluating the effectiveness of DP treatment using a naturalistic design is also essential in order to assess outcomes that are more representative and generalizable for the majority of patients seeking ED treatment.

Despite these limitations, a particular strength of our study was that it is relevant due their clinical implications. Current study suggests that our DP-ED-11h is an effective option to avoid inpatient admissions. Our results show that 7 out of 10 patients treated in the DP-ED-11h have avoided IT; and from those already hospitalized, the program provided a reduction of about one third of LoS. As a day patient treatment structure, it is also effective as a transition resource from a completely hospital based inpatient unit to an outpatient setting fully contextualized in the community. Then, DP-ED-11h can be considered as a middle step enabling a more continuous treatment of AN, supporting the social reintegration of the adolescents and the application of the eating patterns in their environment. This resource offers patients a transitional step, rather than the mutually exclusive intensity of IT or outpatient therapy.

Further research should continue to study the efficacy of DP treatment and to identify the clinical profile of patients with AN who would benefit from DP treatment or not. Thus, according to those characteristics, the clinician may opt for one of the settings, improving clinical decisions and tending to a more individualized treatment.

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CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest.

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